

A MODEL FOR PROTECTING THE PUBLIC
THROUGH CONTRACTOR LICENSING

By

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LIST OF ABBREVIATIONS

ACSI	American community service, inc.
AGB	Association of governing boards
CCSC	Construction complaints study committee
CILB	Construction industry licensing board
CILBN	Construction industry licensing board newsletter
CLB	Contractor licensing board
CLCBP	California legislature committee on business and professions
CLCCPTM	California legislature committee on consumer protection and toxic materials
COI	Central office investigation
CSG	Council of state governments
DPR	Department of professional regulation (FL)
FCILB	Florida construction industry licensing board
FDOL&ES	Florida department of labor and employment security
HLA	Hawaii, legislative auditor
MCE	Mandatory continuing education
NAHB	National association of home builders
NCGEC	North Carolina government evaluation commission
NCLER	National clearinghouse on licensure, enforcement and regulation
NJCSGFIR	New Jersey committee on state government and federal and interstate relations
NJLIPC	New Jersey labor, industry and professions committee
RICO	Regulated industries complaints office
SECCAC	Senate economic, community and consumer affairs committee
SGOC	Senate governmental operations committee
TSSC	Tennessee senate study committee
ULAG	Utah legislative auditor general

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The purpose of this research was to test whether the obligation of government to protect the public from harm resulting from actions of prime contractors was met by regulation of contractors through competency examination licensing processes. A further purpose was to develop a licensing model focusing on the protection of the public.

Information was gathered from all fifty states and two analyses were performed. In the general analysis the independent variables were contractor licensing process features and the dependent variables were selected measures of harm to workers, clients, and general public. Meaningful differences in harm levels were found when dependent variable means for the group(s) with a specific feature were compared to the means for the group without the feature.

One of the features was a licensing law. No meaningful differences between group means were found for level of harm or performance variables. The second analysis was based on grouping state data by whether licensing with competency examination existed prior to 1980. With this grouping, meaningful differences were found in injury incidence rate level and performance, contract bond loss ratio level and performance, and lien bond loss ratio performance. The states requiring a competency examination had higher levels of harm but better performance than those not requiring examination.

Of individuals who took the Florida Contractors' Licensing Examinations, Division I, in October 1987, significant relationships between education, experience, college degree type and outcome were found by calculating chi-square values. Individuals with higher levels of education and fewer years experience did better than expected from this proportion in the sample.

A contractor licensing model was developed from the research. The model elements are a flow diagram, harm rankings, an action matrix, and options lists. The purpose of the model was to aid policy makers in protecting the public from harm through effective contractor licensing.

CHAPTER I INTRODUCTION

An important national goal, to protect citizens from harm, has been the major obligation of the trustee government in the theory of "social contract." The social contract was the giving up of some rights by individuals to the body politic in return for the obligation of the body politic to protect other individual rights from impinging transgressions. The body established a trustee government to perform this function. The concept of social contract has been evident in the writings of Aristotle and Thomas Aquinas. Locke, Rousseau, and Hobbes elucidated the theory of Social Contract in the 1700s. The ideas of these great thinkers form the foundation of American political society.

As a land grant university the University of Florida has been inextricably involved in interaction with industry and through research can partially fulfill its mandate by providing guides for the regulatory processes for individual industries. The School of Building Construction has been the foremost higher education program in construction in Florida, a leader in

construction research and industry interaction. The College of Education has held a prominent place in educational leadership in the nation. As a degree candidate in the joint Ph.D. program between these two academic elements, the researcher undertook developing a model to guide the construction regulation process.

This researcher examined that expression of the social contract involving prime construction contractors, the public directly affected by them, and state government. The research included an analysis of inputs, processes, and outputs of contractor licensing and concluded with a model for such licensing.

Measurement techniques were drawn from insurance theory in that part of the research examining harm levels and performance. The risk transference instruments of worker compensation insurance, premises and operations insurance, completed operations insurance, and surety and fidelity bonds were particularly appropriate links between contractors and their employees, clients, and the general public. Aggregate statewide average premium rates for these instruments were used as measurement variables.

The inputs to the licensing process were the applicants for licensure. The researcher maintained that the competency examination feature found in some licensing structures had the most potential for affecting the level of protection to the public and therefore dedicated a

portion of this research to the analysis of examinee attributes related to passing a contractor licensing exam.

Statement of the Problem

At the time of this study, construction industry regulation was at a crossroads. Many existing contractor licensing laws were under review by "sunset" provisions of state laws. Under these laws, regulatory statutes may be automatically repealed if they are not shown to be beneficial. Construction industry licensing boards have been found to have ineffective features through sunset reviews. The trend toward more states having contractor licensing laws was continuing, but more and more occupational and professional licensing requests by professions were undergoing "sunrise" hearings prior to legislation. The effectiveness of governmental regulation was no longer taken for granted.

The problem addressed in this research was the need to know whether the process of licensing contractors could protect the public and to identify the features of contractor licensing appropriate to that end.

Purpose of the Study

The purpose of this research was to test whether the obligation of government to protect the public from harm resulting from actions of prime contractors was met by the regulation of contractors through competency examination licensing processes. A further purpose of the research

was to develop a licensing model focusing on the protection of the public.

Hypotheses

This research involved the testing of the following null hypotheses:

H₁. There was no relationship between state contractor licensing agency features and levels of harm.

H₂. There was no difference between the licensed and nonlicensed contractor groups as measured by the level of employee injury incidence rates or worker compensation insurance rates.

H₃. There was no difference between the licensed with competency exam and nonlicensed contractor groups as measured by the level of employee injury incidence rates or worker compensation insurance rates.

H₄. There was no difference between the licensed and nonlicensed contractor groups as measured by the level of lien bond loss ratios.

H₅. There was no difference between the licensed with competency exam and nonlicensed contractor groups as measured by the level of lien bond loss ratios.

H₆. There was no difference between the licensed and nonlicensed contractor groups as measured by business failure rates or level of contract bond loss ratios.

H₇. There was no difference between the licensed with competency exam and nonlicensed contractor groups as

measured by business failure rates or level of contract bond loss ratios.

H₈. There was no difference between the licensed and nonlicensed contractor groups in level of harm to the general public as measured by liability insurance rates.

H₉. There was no difference between the licensed with competency exam and nonlicensed contractor groups in level of harm to the general public as measured by liability insurance rates.

H₁₀. From 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in employee injury incidence rate.

H₁₁. From 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in lien bond loss ratio.

H₁₂. From 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in contract bond loss ratio.

H₁₃. There was no significant difference in proportional frequency of different college degree majors between failing group and passing group for the Florida Certified Contractor's Examination.

H₁₄. There was no significant difference in proportional frequency of different levels of education

between failing group and passing group for the Florida Certified Contractor's Examination.

H₁₅. There was no difference in proportional frequency of different levels of years of experience between failing group and passing group for the Florida Certified Contractor's Examination.

H₁₆. The licensing agency features, competency examination, task analysis base for examination, disciplinary process, power to revoke, liability insurance, license bond, and public information availability were equally effective in reducing levels of harm to the public.

Background and Justification

All state governments have some form of professional and occupational regulatory structure. Each state government has the right to establish a contractor licensing procedure, but as of 1984 there were only 24 states that licensed prime contractors, of which only 13 had a competency exam requirement (NAHB, 1985)

One general trend which has been identified by Hogan (1979) that was particularly applicable to the current situation in the construction industry was that "once a specific occupation achieves licensing in several states, it is not long before most states license that occupation" (p. 243). He reported that it takes less than 12 years to

go from 10% of states licensing a specific occupation to 50% of states licensing that occupation (Hogan, 1979).

Construction industry professionals historically have been slow to regulate themselves. The American Institute of Constructors, one of the few industry professional groups, was not founded until 1972. Construction licensing typically has been administered by local governments under their general licensing ordinances and/or by state governments under a contractor licensing statute.

Whether a profession had weak or strong professional organizations, it was likely to seek statutory licensing. Professional regulation can be performed by nongovernmental bodies. Some of these nongovernmental organizations had considerable power and scope exercising control through membership requirements, facilities and program accreditation, and certification of specialties. They were very influential with their respective licensing boards (Hogan, 1979). Historically, strong professional groups seeking to regulate their professions also regulated themselves. From initial voluntary regulation, professions moved to statutory licensing, recognizing that it would give "legal sanction to their codes of ethics and requirements for membership" (Shimberg, Esser, & Kruger, 1972, p. 12).

A typical regulatory system for contractors is shown in Figure 1.1 with statutory features and regulatory subprocesses. Examination processes often are evaluated on the basis of passing rates and number of complaints; disciplinary processes have been evaluated on the basis of number of cases or reduction of consumer complaints. Few evaluations of licensing agencies are concerned with the effectiveness of the process in terms of its purposes; instead they are based on a review of the efficiency of subprocesses. The focus of the first phase of this research was on measures of level of harm to the public where these levels were compared between states with and without contractor licensing.

The approach developed may serve as a guide for performance studies in other regulatory agencies. A broader result of this research may be not only the transferability of the performance evaluation approach to other professional licensure systems but also the refocusing of professional licensing processes on protection of the public.

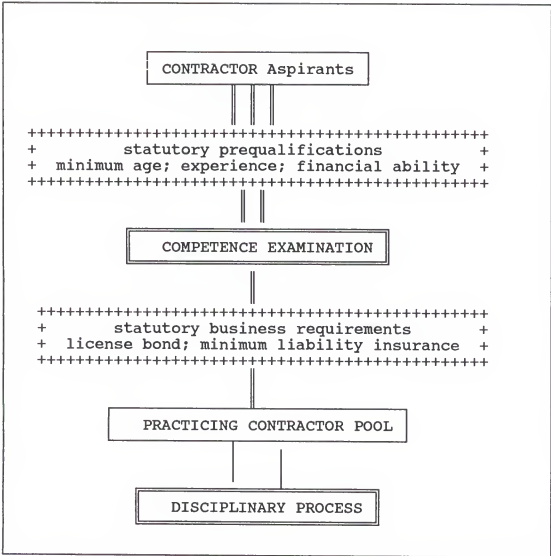


Figure 1. Contractor Regulatory System.

Limitations and Delimitations

Limitations

The data collected in the licensing performance phase of this research contained built-in inconsistencies. Each state had its own laws, rules, and regulations as far as the licensing agency structure was concerned, although there were similarities. Each state also has its own laws concerning the insurance business as conducted in its jurisdiction. There were differing mandatory minimum insurance limit requirements for different states; there were also different risks in different states. There were differences in the judicial structure and the impact of liability awards between states. The researcher concluded, however, that the similarities between states outweighed the inconsistencies. Where major differences have been found, only those states with similar features were used in the analysis. The researcher deliberately looked for a wide range of risk measures so that individual anomalies would not disproportionately affect the analysis.

The contractor regulatory process is dynamic. The dynamic nature of this process implied limitations to the measurement process of the effectiveness of specific regulatory features. States with varying levels of harm have taken different licensing approaches to alleviate their problems. Researching the effectiveness of the

regulatory process for contractors proved somewhat problematic due to the dynamic nature of contractor licensing. For example, a new licensing requirement taking effect for new applicants may allow for "grandfathering" already-practicing contractors, meaning that those contractors in business do not have to meet the new requirement. Table 1.1 is included in this introductory chapter. Table 1.1 shows the effect of a new requirement for applicants after a given date with practicing contractors as of that date grandfathered in, meaning contractors already in business did not have to meet the new requirement. Specifically this table shows how the relationship between practicing contractors who have met the new requirement and those who have not changed over the passage of time.

Table 1.1

New Requirement Effect on Contractor Pool

Reg. Year	<u>Grandfathered</u>		<u>Regulated</u>		<u>Total</u>	Reg. %
0	10000	-1000	1500	-150	10350	13
1	9000	-900	2903	-290	10712	24
2	8100	-810	4219	-422	11087	34
3	7290	-729	5460	-546	11475	43
4	6561	-656	6636	-664	11877	50
5	5905	-590	7753	-775	12293	57
6	5314	-531	8822	-882	12723	62
7	4783	-478	9848	-985	13168	67
8	4305	-430	10839	-1084	13629	72
9	3874	-387	11799	-1180	14106	75
10	3487	-349	12735	-1274	14600	79
11	3138	-314	13652	-1365	15111	81
12	2824	-282	14553	-1455	15640	84
13	2542	-254	15444	-1544	16187	86
14	2288	-229	16327	-1633	16753	88
15	2059	-206	17208	-1721	17340	89
16	1853	-185	18088	-1809	17947	91
17	1668	-167	18971	-1897	18575	92
18	1501	-150	19860	-1986	19225	93
19	1351	-135	20758	-2076	19898	94
20	1216	-122	21667	-2167	20594	95

Assumptions: 10% attrition and 15% new contractors

Table 1.2 lists the percentage of contractors regulated by the new requirement for 5%, 10%, 15%, and 20% new contractor growth rates.

Table 1.2

Pool Percent Regulated at Varying Growth Rates

Annual percent new contractor influx				
Year	5%	10%	15%	20%
0	5	9	13	17
1	9	17	24	31
2	14	25	34	42
3	18	32	43	52
4	22	38	50	60
5	25	44	57	67
6	29	49	62	72
7	32	53	67	77
8	36	58	72	81
9	39	61	75	84
10	42	65	79	87
11	44	68	81	89
12	47	71	84	91
13	49	74	86	92
14	52	76	88	94
15	54	78	89	95
16	56	80	91	95
17	58	82	92	96
18	60	84	93	97
19	62	85	94	97
20	64	86	95	98

Assumption: Attrition rate is the same for regulated and grandfathered contractors.

The state regulatory process for contractors differed from the regulatory processes for architects, engineers, lawyers, and doctors in that it is not the sole independent licensing path for the industry professional. Counties and municipalities often license contractors to practice in their jurisdiction, setting their own requirements for competence. Local licensing processes in different states, therefore, may have strengthened or diluted the effectiveness of the state licensing process in protecting the public from harm.

Delimitations

In phase two of this research, examinee attributes were reviewed. This review targeted only prime contractor licensing, which included general, building, and residential construction contractors. In Florida these made up the Division I contractors under the licensing law. Specialty contractors such as mechanical, roofing, swimming pool, and plumbing contractors were not a part of this study.

This research considered only statewide contractor licensure and did not concern itself with county or municipal certification requirements or procedures. This research did not attempt to do an item analysis of the Florida exams. American Community Service, Inc. (ACSI), the consultant to the Florida Construction Industry Licensing Board (FCILB), had already done such an analysis

during development and testing of the new exam. Furthermore, the exams were classified and were not available to the public.

Definition of Terms

The following terms are defined as they were used in this study.

Certified contractor was a contractor who had a certificate of competency issued by the Department of Professional Regulation.

Certified Contractor's Examination was the competency examination administered by the Florida Construction Industry Licensing Board to determine which applicants for licensure join the eligibility pool for certified contractor licenses.

Completed operations insurance was "a form of liability insurance which covers accidents arising out of operations which have been completed or abandoned, provided the accident occurs away from the premises owned, rented or controlled by the insured" (Davids, 1977, p. 57).

Contract bond was a "guarantee of the faithful performance of construction contract and the payment of all labor and material bills incident thereto" (Davids, 1977, p. 64).

Division I was one of two divisions into which the Florida Construction Industry Licensing Board was

subdivided. This division included General Contractors, Building Contractors, and Residential Contractors. These three different prime contractor categories were separated on the basis of type and complexity of work.

Division II was one of two divisions into which the Florida Construction Industry Licensing Board was subdivided. Division II included all contractors requiring licensing other than those included in Division I. For the purposes of this research the contractors in this division were referred to as specialty contractors.

Eligibility pool were examinees who had received an overall passing grade on a Division I Florida Certified Contractor's Examination.

Examinee was an applicant who took one of the October 1987 Florida Certified Contractor's Examinations, Division I, and received a score.

Fine was a monetary penalty imposed by the administrative agency for violation of an administrative rule or regulation.

Loss ratio was the "percentage of losses to premiums" (Davids, 1977, p. 157).

Passing rate was the percent of a group or category of examinees that received a passing grade on the October 1987 Florida Certified Contractor's Examination, Division I.

Premises and operations insurance was the public liability insurance to cover the activities of the insured and his employees in the conduct of his business on his premises as well as away from the premises wherever the performance of his business required him or his employees to work (Davids, 1977).

Prime contractor(s) was one or more of the three Division I contractors, general contractors, building contractors, and residential contractors.

Probation was the disciplinary state in which the professional was permitted to practice, but under conditions imposed by the administrative agency.

Qualifying agent was the license holder who qualified a corporation to do business as a construction contractor.

Registered contractor was a contractor who had registered with the Department of Professional Regulation after meeting the competency requirements in the jurisdiction for which the registration was issued.

Reprimand was the disciplinary reproof of the professional by the administrative agency.

Revocation was the involuntary termination of the professional's license.

Specialty contractor(s) was a Division II contractor.

Suspension is the disciplinary action taken after which the professional was not permitted to practice for a period of time.

Organization of the Study

This first chapter contains an introduction to the study, a statement of the problem and its significance, and a list of the hypotheses to be tested. Chapter II is a review of the literature related to the interrelationships of professionalism, professional licensure, and professional education in general and in respect to the construction industry. Chapter II begins with background information on the scope and size of general professional regulation, construction licensing, and construction education programs. In Chapter II the criteria, problems and arguments presented in hearings, and evaluative studies of professional regulation and licensing boards are included. This chapter also includes a detailed analysis of the development and functioning of state regulation of the construction industry in Florida. Chapter III contains research methodology, research design, data collection procedures, and data analysis. The results of the analysis in descriptive and tabular form are presented in Chapter IV. Chapter V contains a summary of the results of the study, conclusions, and recommendations for future research.

CHAPTER II REVIEW OF THE LITERATURE

Introduction

The purpose of this research was to test whether the obligation of government to protect the public from harm due to prime contractors is met by the regulation of contractors through competency examination licensing processes. In order to test for protection of the public from harm, a cogent review of the literature was necessary in several subject areas to provide the theoretical underpinnings and knowledge of current applications in professional regulation necessary for this research. This chapter includes a presentation of general professional regulation describing the legal theory, purpose, history, nature, and structure of licensing. Reviews of proposed professional regulation hearings and evaluative studies of regulation are presented in the first section. In the next section, a similar review of the literature on construction industry regulation is presented. The chapter concludes with a detailed analysis of a single state's construction industry regulatory process.

Professional and Occupational Regulation

Purpose

The prevailing conception of regulation has defined it as a form of social control that comes into being through an exercise of authority. As shown by Hogan (1979), regulation emphasizes control, discipline, the elimination of quackery and charlatans, and the protection of the public from incompetent practice.

The major argument for licensure was stated by Milton Friedman (1962) as follows:

Individuals, it is said, are incapable of choosing their own servants adequately, their own physician or plumber or barber. . . . Most of us, it is said, are therefore incompetent and we must be protected against our own ignorance. (p. 148)

Generally, in accordance with the philosophy of caveat emptor, consumers are expected to be able to protect themselves. This is acceptable unless they are at a disadvantage in choosing or working with the provider of the service. Consumer disadvantage can be a characteristic of the consumer or can result from the nature of the regulated profession (HLA, 1983).

To fulfill the basic purposes of licensure, agencies have established entry requirements, disciplined errant licensees, and empowered authorities to prevent unlicensed practice (Hogan, 1979). Boards served as gatekeepers to determine the qualifications and competence of applicants.

The boards also saw that standards were adhered to by practitioners and resolved disputes between the public and the practitioner (Shimberg, Esser, & Kruger, 1972).

The public expected that licensees had met certain qualifications. Sweet (1985) concluded that "licensing laws should represent to the public that the licensee meets a minimal level of competence, honesty, and financial capacity" (p. 422). As put by Leroy Layton, then president-nominee of the American Institute of Certified Public Accountants, "licensure carries with it an inference that the licensed individuals have met qualifications and standards necessary for the protection of the public" (NJCSGFIR, 1972, p. 20).

Sweet (1985) stated that practitioners should be subject to disciplinary control after entry into the profession. Suspension or revocation of a license may be justified for misconduct or gross incompetence. He went on to say, however, that the effectiveness of post-admission disciplinary powers has been limited. Suspension and revocation were almost always challenged in court, administrative agencies were almost always understaffed and underfunded, and the courts seemed to make a redetermination of what was proper in each case. Hogan (1979) concurred:

In most licensure laws a provision exists for disciplining practitioners who are not performing in accordance with the stipulations of the law. Typically a state board is

responsible for administering disciplinary actions. These boards generally have the power to promulgate rules and regulations, to investigate complaints, to initiate hearings, and to make final dispositions of individual cases. They have the power to censure a practitioner or to suspend or revoke that person's license. Such action is generally justified not on the basis of the board's power to punish, but its duty to protect the public against further harm from incompetent and unethical practice. (p. 256)

History

Growth and extent of professional licensing

Until the early twentieth century, the history of professional regulation in the U.S. is largely the history of the regulation of the medical profession. The following historical data were abstracted from Hogan (1979, p. 225-229). In 1639 Virginia set maximum fees to be charged for medical services. In 1649 and in 1665, respectively, Massachusetts and New York passed laws about quackery (which were unenforceable). In 1798 Maryland established a "Medical Board of Examiners" and began examinations. In 1803 Massachusetts decreed that the Harvard medical degree was enough to allow a physician to practice. Other states soon followed, and from 1830-1845 the number of medical colleges in U.S. more than doubled. Reflecting the laissez faire policy of the time, 1845 saw amendments to or abolishment of licensing acts while ten states repealed earlier legislation. By 1849 only New Jersey and the District of Columbia had adequate

regulatory laws. In 1847 several state societies formed the American Medical Association. In 1873 Texas established a state examining board, and nearly all states followed suit by 1895. By 1900 all states had mandatory licensing in medicine, and 22 required both a diploma from a medical school and successful passage of an exam.

Growth of regulation in other professions occurred in the early twentieth century. Hogan (1979) reported that in the period from 1911 to 1915 alone, 110 statutes licensing 24 occupations were enacted. Shimberg (1980) continued historically where Hogan stopped, stating that

between 1910 and 1920, approximately 130 laws were passed regulating 14 health-related occupations. By 1970, 13 of these health-related occupations were being regulated by all 50 states. Non-health occupations also began to be regulated. The first barber law in the United States was passed by Oregon in 1899. Today every state in the union licenses barbers and cosmetologists and dozens of other occupations. . . . As the nation entered the 80s, a U.S. Department of Labor study reported that more than 800 occupations and professions were regulated by state law, to say nothing of those regulated by federal and local law. (p. 7)

Since 1970 there has been a small revolution in occupational regulation. According to the Tennessee Senate Study Committee (1984), centralization of state bureaucracies, the consumer movement, and sunset legislation have combined to focus on occupational regulation. In the recent past there has been a movement toward accountability in government. As a result, state

governments have moved to reorganize their administrative bureaucracy and to streamline their management. In 1969 there were 16 states with central licensure agencies. Another reason for the new focus on licensing issues was the rise of the consumer movement since the early 1970s. In 1976 Colorado was the first state to adopt sunset legislation. Eight years later Massachusetts became the 38th state with a sunset law. Occupational and professional licensing boards were regularly included in sunset legislation.

Sunset legislation

Sunset legislation began in Colorado in 1976. By 1980 thirty states had sunset statutes. The idea behind these laws was that certain state agencies would be scheduled for termination each year and would be audited or subjected to program performance review to determine whether they should be continued or modified (NCLER & CSG, 1987). In these reviews, two questions typically found were (a) "is there a strong enforcement process so that errant practitioners are identified and dealt with?" and (b) "is there a need for continuing competency assessment practices, such as continuing education?" (TSSC, 1984, p. 42). Too often these reviews have dealt with the inputs into the process and with efficiencies within the system. Disciplinary procedures were nearly always evaluated in terms of reducing complaints.

The promise of sunset statutes was short-lived. By 1981, one statute was repealed, and by 1986, three other states had repealed or abandoned sunset statutes. No sunset statutes have been adopted since 1981. Sixteen states have modified their statutes as many as five times (NCLER & CSG, 1987).

Sunrise legislation

As a consequence of the increase in health occupational and professional groups wanting occupational licensing laws, the U.S. Department of Health, Education and Welfare in 1971 (NCLER & CSG, 1987) proposed a two-year moratorium on enactment of new licensing laws for health occupations. The first new legislation was enacted in 1973 in Minnesota. The legislation established a mechanism to evaluate and coordinate the credentialing of allied health personnel through an advisory committee to the state board of health. Performance evaluation criteria have been adapted from a 1977 New Jersey study credentialing health manpower, essentially focusing on

potential harm from lack of regulation, public benefit from regulation, existence of other means of protection, and the appropriateness of licensure as a remedy. Conducting reviews of proposed legislation is frequently referred to as "sunrise" by state legislatures and agencies. (NCLER & CSG, 1987, p. 154)

Sunrise legislation became necessary because of the pressing demand of professions for regulation and the relatively brief exposure to issues afforded by the

typical legislative hearing. Legislators were left "heavily dependent upon the petitioning group for information" (NCLER & CSG, 1987, p. 160). Typical of the fundamental questions addressed by sunrise review concerned (a) whether the public needed additional protection or if the normal range of consumer protections were adequate and (b) whether additional protection was required and if licensure was the best means to that end (Kasper, 1977).

About half of the current sunrise programs included all occupational regulation in their review (NCLER & CSG, 1987, p. 155). More recent sunrise laws tended to mention economic impact of regulation more prominently (NCLER & CSG, 1987). The Auditor General of Hawaii (HLA, 1983) wrote, "professional and vocational regulation should be eliminated where its benefits to consumers were outweighed by its cost to taxpayers" (p. 4).

Nature and Structure

Legal basis

"The police and public welfare powers granted to states by their constitutions permit states to regulate who may practice professions and occupations" (Sweet, 1985, p. 204). The statutes and regulations set criteria for professional practice and administer systems that determine who may perform the services (Sweet, 1985).

Deliberate gaps were left by the statutes, and regulatory agencies must make rules and regulations to implement the concepts stated in the statutes. Examination details are determined by the agency (Sweet, 1985).

Levels of regulation

The most common reaction to the need for professional regulation is to suggest the enactment of stiff licensing laws--laws that would eliminate quacks and incompetents from the field and would enforce and ensure high standards of practice. (Hogan, 1979, p. 218)

The most common form of state regulation are registration, certification, or licensing laws.

Registration. Individuals are required to register officially if they wish to do certain types of activities. No examination is required. No provision is made for denying the right to engage in the activity to anyone who registers. A fee may be charged (Friedman, 1962).

Certification. The second level is certification. The governmental agency may certify that an individual has certain skills but may not prevent, in any way, the practice of any occupation using these skills by people who do not have such a certificate (Friedman, 1962). One of the best examples of this is accountancy. Most often there is a competency exam, and upon passing the exam, the professional is deemed a "certified" public accountant.

Licensing. The next level is licensing proper. One must obtain a license from a recognized authority in order to practice. Obtaining the license requires some "demonstration of competence or the meeting of some tests ostensibly designed to insure competence" (Friedman, 1962, p. 145). Unlicensed practice is against the law.

The term "licensing" as used in this research encompassed all forms of regulation that authorize the licensed practitioner to practice and was not the limited term implying successful completion of a competency examination unless expressly stated.

Admission requirements

Licensing laws generally require candidates to meet four types of qualifications: (1) general or personal requirements such as good moral character, citizenship, and residency; (2) formal educational requirements; (3) experience requirements, such as apprenticeships, internships, and supervised practice; and (4) successful completion of an examination administered by the licensing board or other acceptable body. (Hogan, 1979, p. 252)

Hogan went on to say that the connection between these requirements and the level of practitioner competence has never been demonstrated, and "direct empirical research on this question is almost totally unavailable" (Hogan, 1979, p. 252). Shimberg et al. (1972) duplicated the qualification categories by giving the following as typical for licensure: experience, age,

education, citizenship, good moral character, and literacy in English.

The report of the New Jersey Professional and Occupational Licensing Study Commission recommended that education and experience requirements be emphasized in professional licensing, and further recommended that education and experience entry requirements be clearly related to the purposes for which professions or occupations are regulated (NJCSGFIR, 1972). Shimberg et al. (1972) pointed to the experience requirement as the most important prerequisite. Seldom did one find a licensed occupation not requiring some specified period of experience or some training and experience combination.

Competency examinations

In a society which is becoming increasingly litigious, licensing exams are being scrutinized more closely so as to avoid the probability of lawsuits by people who have failed the exam and have been denied a license. Because of this increasing risk, licensing exams must meet well-documented professional and legal standards such as those found in the equal employment opportunity guidelines. Some criteria for a licensing exam are that it must be job related and based on an empirically conducted job analysis. Statistical procedures should prove the exam's reliability, and accepted criteria should be used to establish its cut-off scores (TSSC, 1984).

However, the ability to meet these criteria have been severely weakened by the inability to develop and demonstrate the rational correlations between job requirements and the measurement system used for occupational certification and qualification (Shimberg et al., 1972, p. 198). The problems of analysis are (a) inadequate sampling of crucial skills, (b) a lack of standardized procedures, and (c) inadequate performance evaluation criteria (Shimberg et al., 1972, p. 198).

Performance competencies and considerations

As indicated in the historical review section, licensing has usually focused on testing applicants for the initial license and has been less concerned with the competence and performance of practitioners after granting of the license (TSSC, 1984).

Admission, discipline, evaluation, and recertification have all been designed to obtain and maintain performance competence in a regulated profession. "Grandfather clauses" and other exceptions allowed in the admissions process, a lack of cause and effect relationships between input requirements and professional performance, and the fact that extraneous noncompetence factors may affect performance are all considerations that have affected the ability of a professional licensing process to provide for performance competence. These considerations lead us to rethink the current focus on

inputs just as, in the educational field, the U.S. Department of Education proposed requirements for accreditation agencies to assess how much students learn, in addition to their current requirements. According to former Commissioner of Education William Bennett, these agencies have traditionally looked at inputs, such as the number of library books or the percentage of faculty with Ph.D.s; he said that the focus should, instead, be on "outcomes, or student achievement--what students actually learn" (Bennett, 1987, p. 43).

The January 1971 Report of the New Jersey Professional and Occupational Licensing Study Commission contended that the prime requirements for entry into a profession were education, experience, and examination, and where licenses were granted automatically under a grandfather clause without the practicing professional having to meet entry requirements, those licensed under such clauses should be subject to entry requirements including examination within a reasonable time. No exemption from examination should be granted (NJCSGFIR, 1972). Granting exceptions to these practicing professionals gives recognition to individuals who have not earned it through a demonstration of competence measured by their education, experience, and passing an examination. The public, however, would have reason to

believe that the individual carrying that license had demonstrated competence (NJCSGFIR, 1972).

Historically, performance competency was assumed to be determined by input measures, and emphasis was placed on setting of professional standards through application qualifications and licensing; however, the true effectiveness of input regulation was dependent on its relationship to output. If there were no cause and effect relationship between the standards and criteria used in measurement of input and output performance, then the objective of licensing would not be achieved. Measurement of output should be the focal point, and, until recently, defining outputs and designing methods for their measurement had been difficult in most professions (Hogan, 1979).

Before making the link between performance competencies and input requirements, including education, it was necessary to understand what factors have an impact on performance competency and how performance competencies can be judged. In the search to find out what makes some workers more effective than others, three factors have been discovered to have an impact on performance competency. These are (a) cognitive skills, (b) interpersonal skills, and (c) motivation. Cognitive skills appear to be greatly impacted as a result of college education; those who attend college as

undergraduates seem better able to think conceptually. This newly honed ability--not the knowledge acquisition of a content area nor the use of this content knowledge--was what distinguished the superior from the average or inferior performers (Klemp, 1977).

To measure these three aspects of effective performance so that performance competency can be judged, two analyses can be used. Job analysis (empirically conducted) may reveal the needed levels of both knowledge and cognitive skills, while a critical incidents analysis can measure the role non-cognitive components such as interpersonal and communication skills, attitudes, and personal attributes such as ethics and responsibility play in performance competency (Shimberg, 1977).

Even after all that is feasible has been done to strengthen the tie between input requirements and performance competencies, it must be realized that harmful performance is not eliminated. Performance hinges on many factors not directly related to (or controllable by) the particular job. For example, in 1970 it was reported that the quality of medical care remained dependent on the extraneous factors of hygienic environment, financial access to medical resources, geographic accessibility, and other non-job-related factors which were generally beyond the control of the medical professional and thus in no way reflected on his competency as a practitioner (Hogan,

1979). In Fine and Morehead's study in New York State (in Slater & Bryant, 1975) it was shown that satisfactory performance of physicians was significantly correlated with whether a hospital was affiliated with a medical school. The researchers found that there was only a mixed correlation between board certification and satisfactory performance in the several diagnostic categories reviewed. They also found that there were substantial differences in the evaluation of professional performance in diagnostic categories (Slater & Bryant, 1975).

"There is no doubt that the problems of defining competence and measuring it need further study before formal reassessment procedures can be introduced or used with confidence as a basis for determining who is and who is not competent to continue in practice" (Shimberg, 1977, p. 161). The legal profession was illustrative of these difficulties in definition and measurement. The legal system in the United States was confronted with the question of performance competence and the enforcement of competency standards. Originally, the legal profession relied solely on the model Code of Professional Responsibility of the American Bar Association, which contained the standards of ethical practice. However, the enforcement of this standard encountered difficulties, namely, matters of proof at trial. Also, as yet unavailable were any extensive empirical data which could

reveal the lack of competency existing in the legal profession at both the state and federal levels. The creation of peer group standards boards "which would warn lawyers when their competence is in doubt by the courts before which they practice and then provide some regimen or program for those lawyers to improve their competence" (Bradner, 1978, p. 40) has been suggested as a solution by a judicial study group within the federal court system.

Continuing education and recertification

Licensing laws have been changing to include specifications that attempt to guarantee professional competency throughout the practitioner's professional life. The device most often used to accomplish this purpose has been mandatory continuing education (MCE).

Many have been unhappy with MCE, and their criticisms have been more widespread recently for many reasons. From these criticisms, many questions have been raised, including (a) who defined and provided mandatory continuing education, (b) whether MCE was related to on-the-job performance, (c) whether the astounding cost of MCE was worth the benefits, and (d) which professions, if any, should require MCE programs (Shimberg et al., 1972).

While mandatory continuing education may have sounded like an excellent idea, like so many other ideas, it has been more difficult to implement than it would seem. First of all, decisions were needed regarding what

should be included in a program, and who should define it, provide it, and implement it. Performance measures must be established and decisions on accessibility must be made. These were questions that have been raised because of problems with existing MCE programs, and questions pertaining to any MCE program that have not been satisfactorily answered (Shimberg et al., 1972).

There has been a lack of evidence to establish a relationship between mandatory continuing education and competence and on-the-job performance. The MCE programs in effect at the time of this study relied on the practitioners to select from a group of accredited courses those that they believe to be most appropriate and beneficial. Two assumptions were implicit in this: first, that practitioners knew which courses they needed and, second, that they would choose the courses most rewarding and beneficial from a professional viewpoint (Shimberg, 1977). These assumptions were not always correct. In many cases, the practitioners have chosen what was available to fit their schedules, regardless of whether it was either appropriate or beneficial.

In a 1983 study of mandatory continuing education requirements done by the California Department of Consumer Affairs, it was reported that (a) most licensing board staff found little or no benefit to the public or licensees from MCE, and (b) the total annual cost of MCE

for licensees was shocking. Eleven occupations and their MCE requirements were selected for the study. For these eleven occupations, the total annual cost to meet the state MCE requirements (excluding lost income) was approximately \$240,000,000. When reported lost income was considered, the cost jumped to an astounding \$416,000,000 (NCLER & CSG, 1987). This cost was hard to justify when there was little evidence that mandatory continuing education was effective.

Some professions, such as education, have had mandatory continuing education requirements for years. Other professions have recently enacted MCE requirements, and still other professions have no MCE requirements at all. One state may have MCE requirements for a profession, while a neighboring state may have no MCE requirements for that same profession. An example of this is the legal profession. Iowa, Minnesota, North Dakota, Washington, and Wisconsin generally require 15 hours of continuing legal education each year, while California, Michigan, and Virginia have considered requirements and rejected them (Bradner, 1978). This lack of consistency is confusing to our mobile society.

In spite of the problems and limitations of MCE, it has been established as a requirement for recertification and/or relicensure in a growing number of professions. The number has been increasing under the unproven

assumption that the mere participation in an MCE program gives assurance of continuing competence (Shimberg, 1977).

Methods of assuring competence other than by mandatory continuing education have been explored. These include examinations, case-record analysis, and peer review. Periodic reassessment by any of these methods, a combination of them, or other methods of evaluation of performance would seem to be a more precise and dependable way to determine if practitioners have maintained their competence (Shimberg, 1977).

Methods other than MCE provide an opportunity for scholars and scientists to work more closely with the practitioners who must demonstrate their continued competence. Colleges and universities should not assume, however, that these methods can be conducted in the same way that professional training is done. The prospective practitioners' time is valuable. Their continuing education should be packaged in ways that it can be absorbed in a variety of situations, "driving between home and office; early in the morning or late at night; alone, or in the company of colleagues" (Shimberg, 1977, p. 165).

Complaints and disciplinary process

In Carlin's 1966 study (in Hogan, 1979), it was suggested that the formal disciplinary process employed by state regulatory bodies was not an important factor in bringing about compliance to the ethical standards and

minimal competency levels demanded by professionals themselves and by the general public. State regulatory bodies have a poor disciplinary record. Many factors have contributed to this poor record, including poor methods of administration; limited budget; lack of investigative skills; inadequate definitions of such terms as "unprofessional conduct" and "incompetence"; excessive time gap between the inception and conclusion of the disciplinary proceedings; and lack of training courses on ethical standards. Licensing boards have tended to adopt narrow interpretations as to what are actually grounds for disciplinary action, and, as a result, the public has been protected from extreme offenses only, which are relatively infrequent. The overall impact is that licensing boards have been "ineffective as disciplinary enforcers" (Hogan, 1979, p. 262).

If the general public is to be protected from the incompetent and dishonest practitioner, the state must provide for a better and stronger enforcement process. One way to do this would be to authorize licensing boards to levy civil penalties for infractions (TSSC, 1984).

Side-effects of licensing

Professional licensing laws were first enacted as an attempt to protect the public from charlatans and incompetent practitioners. While this protection may have been necessary, it became increasingly apparent that problem

areas exist under the current licensure laws and that there were negative side-effects to licensing (Hogan, 1979).

Friedman (1962) believed that licensure often establishes a protection for professions, much like the medieval guilds, because the state gives over power to make licensure decisions to the members of the profession. As a result, the requirements for a license often involve things that appear to have no relation to professional competence (Friedman, 1962). When licensure decisions are made solely by members of the profession, the interests of the producer are served more than the interests of the consumer, and licensing becomes a "tool in the hands of a special producer group to obtain a monopoly position at the expense of the rest of the public" (Friedman, 1962, p. 148). When this occurs, there are many side-effects to licensing that are not in the interest of the general public. Some of these are discussed in the following paragraphs.

According to Hogan (1979), licensing tends to promote the economic well-being of a profession and to promote and defend its reputation. Shimberg et al. (1972) contended that "those who are licensed, including those covered by a 'grandfather clause,' will enjoy a secure position" (p. 13). This secure position and feeling of economic well-being came about as a result of restrictions, through

licensing, on the number and distribution of practicing professionals (Hogan, 1979). These laws are sometimes described as "fence-me-in" laws because they were designed to put a protective fence around the professional by limiting competition and insuring that anyone judged undesirable would not gain entry into the profession (Sweet, 1985).

Three different costs are incurred as a result of licensing. Since licensing statutes generally include educational and experience requirements, it is felt that their cost is passed on to the consumer as an increase in the cost of the service being performed (NCLER & CSG, 1987). Hogan (1979) stated that the full cost of professional education programs, including continuing education courses, all licensing and examination fees, and the cost in lost time, because time spent on these pursuits is passed on to the consumer. The inclusion of economic provisions in sunrise legislation attempted to address this cost-benefit issue. The second cost issue was addressed well by Edward Heil, senior vice-president of First National State Bank of New Jersey. He pointed out that unnecessary regulation and over-regulation by governments on private enterprise business activity was burdening the state and national economies not only because of the increased cost of services to the consumer but also because of the increased taxes that have to be

borne by the taxpayer (NJLIPC, 1980). And finally, since licensure is a static response to a changing process, a response directed to the past, there is the cost to the public in terms of loss of innovation caused by restraints of licensing. Michael Young, president of Larson Mortgage Company stated that this is much harder to bear than the added cost to the consumer (NJLIPC, 1980). Placing restraints on opportunities cause industries to become institutionalized and less responsive to the needs of the public (NJLIPC, 1980).

Licensing laws vary from state to state. States have different requirements for experience, different standards for training, and different examinations and examination pass rates. Therefore, not only is there difficulty in studying the licensing laws, but also interstate mobility of the regulated professionals is hampered (NCLER & CSG, 1987).

Hogan (1979) listed three more major areas in which licensing laws have a negative impact: "(1) the use of para-professionals; (2) methods of organizing and delivering services, professional training, and professional education; and (3) discrimination due to race, sex, age, and wealth" (p. 265). Even though professionals and much of the general public have realized that there are problems with the present licensing system, it is difficult for most Americans to understand the need

for alternatives because they have come to rely on licensure as the major means of protection from unscrupulous professionals. However, there is mounting evidence that licensing may not be protecting the public and that it may be causing a significant amount of harm, suggesting that alternatives to the present licensing system need to be developed (Hogan, 1979).

Alternatives and Improvements

One suggestion for an alternative to the licensing laws is to let the market risk transference vehicle of insurance do the regulating. Insurance companies would take a more active interest in the quality of services provided by those they insure (Kasper, 1977).

The definition of professional regulation should be refined, and more emphasis should be placed on enforcement of existing laws and regulations. As a result of a review of health regulatory boards conducted by the Connecticut legislature in 1980, it was concluded that business practice regulations should be separate from professional regulations, and that business regulations be directed by the Department of Consumer Affairs (TSSC, 1984). This refinement of what should be considered under the classification of professional regulation conformed with the opinion that there should be more effective enforcement of the existing fraud statutes, truth in advertising statutes, and other civil and criminal laws.

A final improvement that has been suggested is the implementation of full disclosure and availability of information such as the type of services offered, list of work completed, client evaluations, accident rates, and complaint history. To improve services, states could require that every licensed practitioner post in his or her office the name of the appropriate state agency to contact in case of a complaint (TSSC, 1984).

Contractor Licensing

Organizational and Relational Differences

Licensee to organization

Construction industry licensing is essentially the qualifying of business entities to practice, even though individuals are the licensees. Corporations, the predominant form of construction business ownership, qualify to conduct business as contractors through the convention of qualifying agents, licensees who put their license at the disposal of the corporation. Typically these qualifying agents, or responsible management executives as they are sometimes called, are required to be actively involved in the operation of the business and the supervision of construction activities. Often a multi-million dollar construction enterprise employs only one active licensee. The qualifying agent may not even have any ownership interest in the business.

For many professions the form of business ownership and/or owner requirements is regulated. For instance, in the legal profession there exists the general restriction that only lawyers may hold ownership in the forms of organization. There is the exception, however, of lawyer-employees of legal service organizations. There is also a general restriction prohibiting lawyers and non-lawyers from entering into a business relationship for the practice of law (Bradner, 1978).

Organization to client

Client contact with a regulated business entity is different than the contact with professionals such as lawyers, dentists, doctors, and architects. In these professions, the client is face-to-face with the person(s) who met the professional regulatory requirements. With a regulated business entity, the client may never even meet the qualified licensee. Lawyer-to-client, architect-to-client, doctor-to-patient, dentist-to-patient, real estate agent-to-client, barber-to-client, and cosmetologist-to-client relationships all require specially qualified practitioners to protect the public (clients and patients).

Repeated contact between professionals and clients was the rule rather than the exception in most professions. In the construction industry there were both repeat clients who were very knowledgeable, and occasional

clients who understand little about construction.

"Unsophisticated consumers purchase construction services only occasionally. They generally do not have the knowledge to prejudge the services they wish to purchase. Neither can they afford to have expert advice in selecting contractors" (HLA, 1983, p. 18). They were, therefore, the most vulnerable to the inexperienced, incompetent and/or unscrupulous contractor. "This group is made up mainly of homeowners and small businesses" (HLA, 1983, p. 19).

Construction Industry Licensing Boards

History

The North Carolina General Contractor Licensing Board, the first such board, was established March 10, 1925. (There were, however, no records of its operation until 1937.) The second was in Maryland in 1927. In the 1930s South Carolina, California, Tennessee, Alabama, Arizona, and North Dakota established contractor licensing, followed by Nevada in 1941. During the 1950s Mississippi, Louisiana, Hawaii, and Utah became new licensing states, along with Washington, Arkansas, Michigan, Alaska, Florida, and Delaware during the 1960s. In the 1970s Oregon, New Jersey, and New Mexico initiated contractor licensing laws. The states establishing contractor licensing most recently were Massachusetts in 1981 and Virginia in 1985.

Many of these licensing systems did not include an examination procedure until long after they started operation. Examination processes were not established in the following states until the years indicated: North Carolina, 1950; Nevada, 1965; Mississippi, 1983; Tennessee, 1986; and Arkansas, 1988. The following licensing states had neither an examination nor a disciplinary procedure: Alabama, North Dakota, Washington, Delaware, Maryland, Alaska, and Oregon.

Purpose and goals

Hawaii's purpose statement, presented below, is typical of most contractor licensing agencies:

The purpose of state regulation through the Contractors License Board is . . . protecting the public against dishonest, unskilled or otherwise unqualified contractors. This . . . is needed to protect investments made by consumers who, for the most part, lack the technical knowledge, the legal expertise, and the financial resources to protect themselves against failure or malpractice by a contractor. (HLA, 1983, p. 18)

In the report it was stated that licensees should be knowledgeable about and capable of doing the work and financially able to complete contracted work (HLA, 1983).

An administrator in the Utah Department of Professional Regulation stated that licensing protects the public by (a) providing some assurance of minimum competency level by requiring contractors to pass an examination and to have a minimum level of experience

before being issued a license, (b) providing some assurance that contractors have adequate financial backing and integrity, and (c) eliminating poor contractors through the complaint and discipline process (ULAG, 1980).

The North Carolina Court of Appeals simply stated the purpose of the act to be the protection of the public from "incompetent builders" (NCGEC, 1979, p. 8). The common purpose of these statutes is to protect the public from harm. Most of them identify honesty, financial ability and construction competence as necessary to protect the public from financial harm. Although physical harm and poor workmanship are not often specifically stated in purpose statements, nearly all licensing agencies include them in their mission.

Licensing requirements

Qualification requirements differ widely from state to state. They range from simply being of legal age to having minimum construction-related experience, meeting financial capacity criteria, having purchased license bond and liability insurance in set minimum amounts, meeting moral character criteria, and passing a competency examination. Some have residency as well as a minimum age requirements. In the following sections are some examples of these varying state requirements.

Age, residency, and character. The age requirement in contractor statutes corresponds with the age of

majority in the legal sense. For this reason, age was not considered a special requirement of the contractor licensing process in this research. Enforceability of a residency requirement is questionable, as discussed in the section on general professional regulation. Statutes sometimes contain a requirement of good moral character. To satisfy this qualification, references often are required by the licensing agency. The effectiveness of this requirement in identifying suitable applicants was left unproven, even unaddressed, in the literature.

Financial capacity. There was general dissatisfaction with the financial responsibility requirements in the sunset review literature. For example, the Hawaii review flatly stated, "the financial capacity required of applicants serves little purpose" (HLA, 1983, p. 17). In Hawaii, the contractor licensing board had used working capital, current assets minus current liabilities as an indicator of financial responsibility. "Reliance on a routine credit report tells us nothing about the contractor's ability to finance his projects prior to receipt of monthly progress payments" (HLA, 1983, p. 51). In Florida, the Construction Complaints Study Committee (1989, p. 37) recommended that the Construction Industry Licensing Board revise its financial responsibility requirements to a more realistic level. The net worth requirement for general

contractors was \$10,000; the requirement for residential contractors was \$2,500. As with many other requirements, the criteria to determine financial responsibility was often included in the rules of the licensing board and were not part of the licensing law.

Education and experience. Unlike other professionals, contractors do not have common educational or experience backgrounds that prepare them for contracting (HLA, 1983). Shimberg et al. (1972) reported that "the licensing laws relating to the construction trades rarely contain any reference to formal schooling" (p. 84). The researcher found one instance where the experience requirement was modified and one where the suggestion was made for its elimination. In Florida, credit toward an experience requirement was partially satisfied by having a degree from a construction program or construction-related discipline. In Utah, the sunset review committee suggested offering "applicants for the contractors license the choice of "provisional" or "regular" licensure" (ULAG, 1980, p. ii). Because they felt it was not clear if an experience requirement was necessary to protect the public, the review committee proposed posting of a licensure bond in lieu of the four years of experience requirement (ULAG, 1980)

Examination. In Hawaii, the board's rules required applicants in all contracting fields to pass a test on

general knowledge of the building, safety, health, labor, and lien laws of the state, and some basic administrative principles of contracting business. The examination also tested knowledge of the specific contracting fields being applied for (HLA, 1983).

General knowledge of construction methods is the first requirement. Contractors must also have some basic comprehension of the law and legal obligations as they deal, of necessity, with contracts. In addition, to be successful as a business, contracting demands such capabilities as those needed for salesmanship and contract negotiations, for financing and accounting, for managing personnel and for coordinating numerous field operations. (HLA, 1983, p. 7)

A comparison of these competency areas with those competency areas used in the Florida licensing process and task analysis shows a striking similarity. The two primary providers of state contractor licensing examinations were Educational Testing Service, Inc., and American Community Services, Inc.

Disciplinary systems

At the time of this study, California's disciplinary process was typical. Ms. Bonnie Rohme, Chief of Field Operations for the California Contractors State License Board, in describing that state's complaint process stated that the agency tries first to mediate, a process which can take a month. If mediation was unsuccessful, the complaint was sent to Field Investigations, taking from one week to several months. If it was determined that

there were violations, the agency proceeded to a disciplinary action to suspend or revoke the contractor's license, which was a lengthy process. The action went through a regional office to the attorney general's office for preparation and formal approbation, and a hearing (if requested), and then the case went on to the office for administrative hearings. "It's been known to take months, and even sometimes a couple of years" (CLCBP, 1981, p. 7).

The complaint process and the disciplinary system are often inseparable. Like in the California system, attempts often are made to satisfy the complaints arising in the field before they become disciplinary cases. Many times mediation or arbitration is used, even though some states see this as beyond the scope of their enforcement function (CLCCPTM, 1981). Long case durations and backlogs in the system are also prevalent. To alleviate the complaint backlog, the California contractors' license board instituted a "citation system" for immediate action on a violation. This system's two dimensions are (a) requiring contractor to make repairs or to do the work the way it should have been done, and (b) imposing a financial penalty of up to \$1,500 (CLCBP, 1981). Florida has recently instituted a similar system.

There are always alternatives to using the complaint process and disciplinary system of the regulating agency. For instance, the Utah Auditor General suggested using the

court system or filing the complaint with the State Trade Commission, which has authority to investigate complaints, hold hearings, and, if necessary, request the State Tax Commission to take away a corporate tax number or to issue a cease and desist order (ULAG, 1980).

Evaluations of Construction Industry Licensing Boards

Criteria and objectives

Evaluations of construction industry licensing boards almost always came about as a result of sunset legislation. The Utah evaluation resulted from the objectives of the Sunset Act passed by the state's 1977 legislature. The objectives were typical of these types of evaluations:

1. Determine the extent to which the department and advisory board have operated in the best interest of the public.
2. Determine if licensing of contractors is necessary to protect the health, safety and welfare of the public.
3. Determine if less restrictive methods of regulation are available which would still protect the health, safety and welfare of the consumer. (ULAG, 1980, p. 2)

Problem areas

Reducing competition. The way licensing laws have the ability to inhibit competition was demonstrated in 1973 when 2,149 general contractors took and failed the Florida Construction Industry Licensing Board Examination. Either all applicants were incompetent, the examination was not valid, or the FCILB sought to limit competition by

barring new entrants to the field. After indignant protest from contractors who had failed, the FCILB abruptly reversed itself and reevaluated the grades so that 88% were given passing marks and contractors licenses (Montgomery, 1975).

Because of the dual level nature of contractor licensing and the many different forms of regulation, competition was found to be enhanced through state regulation, as was found in both Florida sunset reviews,. As long as the admissions process was providing a free flow of new practitioners into the industry, competition could be improved through state contractor licensing.

Increasing costs to consumers. Referring to both the design and construction professions, Sweet (1985) concluded that the educational and experience requirements for practitioners and the administration of these regulatory systems increase the cost for providing the design and build services. They also reduced the pool of contractors (Sweet, 1985). The costs of texts, materials, short courses, continuing education courses, and lost time add to the product cost to the consumer.

Misleading consumers. Consumers may believe a builder to be competent, honest, and financially reliable because he is licensed. This might not be true. The issuance of a license could be a false representation by the state (Sweet, 1985). As Ms. Lynn Morris, Executive

Secretary for the State Consumer Advisory Council, stated:

It's certainly the perception of the public that when a contractor has become licensed, that he or she is guaranteed to be competent. The vast number of aggrieved consumers who come to the Department of Consumer Affairs with complaints about shoddy workmanship or failure to complete work would certainly indicate that licensing contractors in California provides absolutely no assurance. (CLCBP, 1981, p. 76)

Ineffective complaint and disciplinary systems. The researcher found numerous instances of slow and/or ineffective complaint and disciplinary systems. Many times the administrative delays were due to governmental legal agencies charged with the responsibility of processing the contractor licensing board's disciplinary case load. In the Hawaii sunset review the committee found enforcement of the law to be severely deficient, with complaints backlogged for several years and few disciplinary actions taken (HLA, 1983). "Should it be decided by the board that the complaint should be referred for a hearing, it took the attorney general's office an average of nine months to prepare the case for hearing" (HLA, 1983, p. 37). Committeeman Stirling's complaint was similar:

Because of this bottleneck of ALJs (administrative law judges) and prosecuting AGs (attorney generals) . . . one of your boards finally locates one of these turkeys that even the profession doesn't want around, and you try to lift his license, and you can't get an administrative law judge and a prosecuting attorney general. (CLCBP, 1981, p. 59)

In the same hearings, Ms. Rohme related that most of the cases pending more than one year had gone through the formal accusation process and "quite frankly with the crush of other cases, once we have them completely investigated, there's a tendency to procrastinate" (CLCBP, 1981, p. 63).

Limited scope of licensing. Three types of limited scope of licensing were found in the literature. The first type was the use of a license to qualify multiple business entities to be construction contractors. This resulted in a lack of supervision by the qualifying agent. The second type involved legal exemptions from licensing (e.g., owner/builder) and a set minimum dollar value of work. Most states allowed some type of exemption for owners; an example of the monetary exemption was a North Carolina license, which exempted work under \$30,000. The third type included illegal, unlicensed construction contracting activities over which the licensing agency may have no control.

The California rent-a-license situation was illustrative of the first type of limited scope. Ms. Peggy Dawson, Public Information Coordinator for the Contractors' State License Board, related that the rent-a-license slogan came into use during the period between 1939 and 1967, when responsible management employees could qualify for any number of licenses (CLCCPTM, 1981).

In California approximately 75 to 80% of complaints were against licensed contractors, and some 20 to 25% of complaints were against unlicensed contractors (CLCBP, 1981). Chairman Filante gave a convincing reason for the unlicensed contractor percentage being low: "People will use unlicensed contractors to get around codes, and therefore they're unlikely to complain" (CLCBP, 1981, p. 96).

Findings and recommendations

Unlicensed practice. Unlicensed activity is a problem in almost all of the regulated professions, according to Larry Gonzalez, Secretary of the Florida Department of Professional Regulation. Construction is the worst, with 56% of the 2601 unlicensed activity complaints received last year being in construction categories (CILBN, 1989).

To combat the unlicensed activity in Florida, a 1987 law "provided for triple damages to an injured consumer in an action for damages against an unlicensed contractor and removed unlicensed contractors from the protection of the mechanics' lien law" (SECCAC, 1987, p. 14). Also in 1984 the Department of Professional Regulation was given "administrative enforcement authority, in the form of cease and desist orders, over unlicensed individuals and established standing in both civil court and the administrative law area" (SECCAC, 1987, p. 69).

Complaint system. The researcher found that, in many instances, the complaint system was the only way a board would know whether an individual was still qualified (NCGEC, 1979). Many problems were found with complaint systems, including administrative delays, lack of funding and staffing, and outside agency delays. In Hawaii, to alleviate their complaints backlog, a new system was implemented where all complaints were channeled to a central point at the Regulated Industries Complaints Office (RICO). RICO has its own team of investigators and its own attorneys to prepare cases for hearings (HLA, 1983). "That the Department of Professional Regulation revise its Central Office Investigation (COI) method of investigating complaints" (CCSC, 1989, p. 21) was a similar recommendation for reorganization from the Construction Complaints Study Committee in Florida.

Reorganization of complaint-handling processes in Hawaii and Florida was only one of many alternatives. Other measures to facilitate the process have been indicated in the research. One of the repeated suggestions was a manual of workmanship standards or equivalent, establishing standards for measuring workmanship complaints in frequently encountered problem areas. "That the CILB develop a set of standards for use in judging workmanship" (CCSC, 1989, p. 24), and "that the DPR review the operation of the toll-free complaints line

and make adjustments to (1) insure accessibility by callers and (2) extend the hours of availability" (CCSC, 1989, p. 32) were two suggestions of the Construction Complaints Study Committee in a review of the Florida complaints process.

The Florida sunset review committee made several recommendations to reduce the number of complaints that result in disciplinary actions being taken by the board. One recommendation was the implementation of a citation system similar to that in use in California. The recommendation was "that the Department of Professional Regulation field investigators be given the authority to issue on-site citations to licensees who commit minor violations" (CCSC, 1989, p. 13). A second recommendation was "that the DPR develop a program which would include a mediation process in the complaint system" (CCSC, 1989, p. 22).

Disciplinary powers. From the research into disciplinary systems it was evident that the basic powers of fines, license suspension, and license revocation were essential to the process. Not only were the powers needed, but also guidelines for their use were necessary. Sometimes these guidelines were found in the rules of the boards. In 1979 the need for the guidelines was recognized, and the recommendation was made that the North Carolina general contractor statutes require the

establishment of guidelines by the North Carolina Licensing Board for Contractors "for the suspension and revocation of licenses" (NCGEC, 1979, p. iii).

Strengthening the effect of the disciplinary process by stiffening the penalties has been recommended by the Florida sunset committee (CCSC, 1989):

During this lengthy process (Florida sunset review of 1988) it became apparent that the disciplinary problems regarding Construction Contractors were approaching an unmanageable level." (p. 1)

Recommendation No 5. That ch. 489.129 be amended to allow the Construction Industry Licensing Board to levy fines up to \$10000. (p. 16)

Recommendation No. 28. That the CILB, when appropriate, impose more severe penalties when disciplining Contractors. (p. 46)

Scope of regulation. When considering the scope of regulation of prime contractors, the researcher found four different aspects of the problem. One aspect was the existence of many different types of prime contractors which should be regulated to the degree they cause or represent a potential for harm to the public. The second aspect was the typical dual-licensing system in effect in many of the licensing states. The researcher found statutory exclusions from the licensing requirements, the third aspect. And finally, the qualifying agent usually was the only person in the contracting entity that needed to be certified as competent.

Prime contractors ranging from residential remodelers to heavy industrial engineering constructors were found. In a letter dated Dec. 30, 1982, to Hawaii's Auditor General from the Contractors License Board Chairman, William W. Wilmore, the researcher found the following pertinent passages:

We agree with this analysis (of the sophisticated consumer) and therefore recommend consideration to deregulate the portion of the construction industry that deals with industrial firms, commercial businesses, real estate developers, government, and other sophisticated knowledgeable industries. Only housing, home improvements, and repairs should be regulated. It should be noted that the great majority of commercial, industrial, and institutional contractors seldom are the subject of complaints and disciplinary action. . . . This system would place the cost of regulation on the segment of the industry that really requires regulation. (HLA, 1983, p. 50)

A North Carolina licensing statute contained an exclusion of contracts under \$30,000 from the designation of general contractors, and thus from the licensing requirement. The committee stated that this "has the potential of subjecting many people, particularly homeowners, to irreparable harm and serious financial loss" (NCGEC, 1979, p. 13) and went on to say that the exemptions were so broad (work less than \$30,000 and/or owner/builder) that the Board lacks jurisdiction in some 80% of all complaints received" (NCGEC, 1979, p. 14).

In Florida, contractors are licensed on a statewide level as Certified Contractors and on a local level as

Registered Contractors. The sunset review committee recommended changes in the law to extend financial responsibility or insurance requirements, or both, to registered contractors (SECCAC, 1987, p. 80).

The North Carolina sunset review committee stated the following problem with only one licensee in an entire construction company:

Another factor which decreases the protection offered the public is the statutory provision which requires that only one person in a contracting firm need be licensed as a general contractor regardless of the size of the firm. As a practical matter it is almost inconceivable that one person can directly supervise the work of more than 10 unlicensed individuals at the same time. (NCGEC, 1979, p. 20)

Nonlicensing regulation of the construction industry.

Other suggestions for protection of the public were found by the researcher that fell outside the licensing arena. They were

the prohibition of certain business practices, governmental inspection, or the inclusion of the occupation within some other existing business regulatory statute . . . [as] preferable, appropriate, or more effective in providing protection to the consumers. (CLCBP, 1981, p. 70)

Committeeman Stanley suggested more effective utilization of the criminal process to get out the bad practitioner and to encourage compliance (CLCBP, 1981). In addition, the Florida sunset review committee recommended "that building officials, including their plan review and

inspection personnel, be certified by the Department of Community Affairs" (CCSC, 1989, p. 40).

Consumer education and public information. Young (1987) stated the virtues of the availability of information. "Indeed, researchers have shown that, if consumers are able to check the veracity of suppliers in any manner, laissez-faire market equilibrium can support high quality" (p. 18). The Secretary of the Florida Department of Professional Regulation recognized the importance of getting information to the public in the following statements in the Construction Industry Licensing Board Newsletter: "The publicity is as important as arresting the unlicensed persons. . . . Consumer education is a big part of any governmental operation. The 'sting' has helped" ("Sting," 1989, p. 1). The Hawaii sunset review echoed the thought, "for some programs, a non-regulatory approach may be appropriate, such as consumer education" (HLA, 1983, p. 5). Finally, the Florida sunset review committee's Recommendation No. 1 was "that a comprehensive consumer education program be instituted under the direction of the Division of Consumer Services, Department of Agriculture and Consumer Services" (CCSC, 1989, p. 9). In California, the Council felt "as other major consumer groups have, that it should be a priority of the Board that complaint data on contractors be kept current and accessible" (CLCBP, 1981, p. 79).

Insurance and recovery funds. Many licensing states have requirements for contractor's liability insurance, but none were found to require third-party or post-construction types of coverage. A recommendation to require Completed Operations Insurance in Florida (CCSC, 1989) and a recommendation in California "that they look very closely at the recovery fund, especially one that was used in Hawaii" (CLCBP, 1981, p. 79) were found in the literature.

Financial capacity. Many concerns were found regarding financial capacity requirements. They usually centered around the criteria used to determine financial capacity, the verification of financial capacity and whether it should be a requirement for recertification. The Hawaii review reflects some of these concerns, "Inasmuch as there is no valid basis for the amounts set as criteria for financial capacity and no proper scrutiny is made of the documents purporting to show financial capacity, this requirement should be removed" (HLA, 1983, p. 21). The Florida committee recommended that

proof of financial responsibility (not) be required at the renewal of certification because of the additional expense and administrative burden on the board. Failure to maintain financial responsibility can be adequately addressed through the disciplinary process. (SECCAC, 1987, p. 103)

Recertification. The following statement from the North Carolina review was indicative of what the

researcher found concerning recertification of contractors by licensing boards:

The means by which the Board assures continued qualifications of competency, ability and integrity is unclear. The Board does not routinely monitor licensees to guarantee that specified qualifications are being maintained. (NCGEC, 1979, p. 10)

Florida Regulatory Structure

History

Laws governing the statewide licensure and regulation of contractors conducting business in Florida were first enacted in 1967. The Florida Construction Industry Licensing Board (FCILB) was created within the Florida Department of Professional Regulation to administer the certification of contractors on a statewide basis and to register contractors who have been certified on a local level. The FCILB was a quasi-judicial body with powers to discipline licensees as well as to administer certified contractor examinations.

State of Florida regulation of prime contractors was initiated in 1967 by Part II, Chapter 468, Florida Statutes. This act created the FCILB, outlined its duties and responsibilities, and established mandatory statewide certification or registration for general, building, and residential contractors (SGOC, 1978). Construction industry regulation, and particularly the provision for statewide certification, was actively supported and

pursued by the industry because of the barriers created over time by inconsistent local government regulation (SGOC, 1978). The current organization of the FCILB and its relation to the DPR as reported in the recent sunset review (SECCAC, 1987) is shown in Figure 2.1

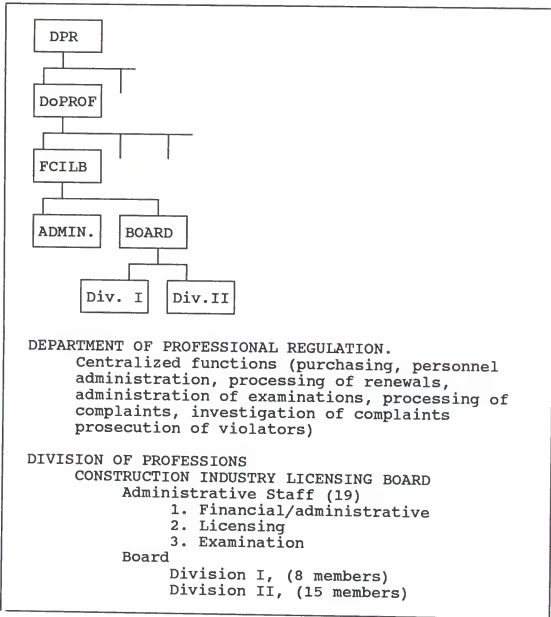


Figure 2.1. FCILB and DPR Organizational Outline.

In the continuing effort to execute its obligations under the law, the Florida Construction Industry Licensing Board changed the contractor examination for licensure. In this action the FCILB was attempting to protect the public through increased contractor financial and business competence. The new exam format includes a new section on business and financial management, and the examination reference book list now includes business and financial management books not on the previous lists. This change could have important consequences for the educational community as it assesses its processes for meeting the educational needs of the industry.

Purpose and role

Legislative intent for all regulatory boards in the Department of Professional and Occupational Regulation was provided in Section 455.001, Florida Statutes. "The purpose of regulating occupations is to preserve the health, safety and welfare of the public" (Florida Department of Labor and Employment Security, 1986). When their unregulated practice can harm or endanger the public and when the potential for harm clearly outweighs any anti-competitive impact which may result, occupations are regulated. State regulation occurs when the public has not been effectively protected by other means or when less restrictive means were not available (Florida Department

of Labor and Employment Security, 1986). Specifically, the original licensing law stated

That in order to safeguard the . . . public welfare, the business of construction and home improvements is a matter affecting the public interest, and any person desiring to obtain a certificate . . . shall be required to establish his competency and qualifications. (Florida Department of Labor and Employment Security, 1986, p. 2)

Licensing process

To qualify for certification an applicant must be at least 18 years of age. The experience requirements for certification are 4 years experience in the trade, 1 year of which must have been at the level of foreman, supervisor, or higher. Formal college credits may be substituted for up to 3 years of the required experience. There are no continuing education requirements (Florida Department of Labor and Employment Security, 1986). The application form in Appendix D indicates specific general, building, and residential contractor requirements.

The 1987 sunset review report (SECCAC, p. 18) listed the maximum license fees the board may charge. These charges are listed in Table 2.1. For certification, "applicant must prove financial responsibility and maintain public liability and property damage insurance" (FDOL&ES, 1986, p. III-9). Rule 21E-15.03, Florida Administrative Code specifies the following amounts of liability and property damage insurance:

Table 2.1

Florida Licensing Fee Schedule

Application and Examination for Certificate	\$250
Renewal of Certificate	100
Late Renewal of Certificate	20
Application for Registration	50
Renewal of Registration	50
Late Renewal of Registration	10
Inactive Status	20

general contractor, \$300,000/\$50,000; building contractor, \$300,000/\$50,000; and residential contractor, \$100,000/\$25,000 (SECCAC, 1987, p. 29). Rule 21E-15.005 states the requirements for certification including "(a) Net Worth as listed below for the following categories of contractors: General Contractor, \$10,000; Building Contractor, \$5,000; and Residential Contractor, \$2,500" (DPR CILB Chapter 21E-12 in SECCAC, 1987, p. 27). The stated financial responsibility grounds on which the board may refuse to qualify an applicant include evidence that the applicant has filed voluntary or involuntary bankruptcy within the five years preceding the application resulting in loss to consumers; the existence, within the five years preceding the application, of an unsatisfied court judgement rendered against the applicant to pay its just obligations to parties with whom the applicant conducted business as a contractor; and an unfavorable

credit report or history as indicated by any of the documents submitted (DPR CILB Chapter 21E-12 in SECCAC, 1987).

The number of active certified Division I contractor licenses for the years 1984-86 (FDOL&ES, 1986, p. III-80) are shown in Table 2.2.

Table 2.2

Florida Active Prime Contractors

	<u>Residential</u>	<u>Building</u>	<u>General</u>
1986	4845	5696	17436
1985	4359	5044	16555
1984	3816	4285	15357

Disciplinary Process

The board may take disciplinary actions against a licensee for certain acts, including

willful or deliberate disregard for and violation of applicable building codes, aiding or abetting unlicensed practice, allowing one's certificate or registration to be used by an unlicensed person, financial mismanagement, or abandonment of a project. (SECCAC, 1987, p. 58)

The major categories of complaints received by the department are unlicensed practice (24%); building code violations (14%); gross negligence, incompetence or misconduct (12%); improper diversion of funds (9%); aiding, advising, or permitting unauthorized practice

(6%); violating a rule of the department (5%); abandonment of professional contract (3%); deceptive, untrue, or fraudulent representation (3%); fraud or deceit in the practice of the profession (2%); and advertising or practicing under false or fictitious name (2%) (SECCAC, 1987).

Sunset reviews

The Senate Governmental Operations Committee, in its 1978 review of the FCILB and construction industry regulation in Florida, made the following summary statement concerning criticism of the examination process:

From its creation in 1967 through most of 1974, the Florida Construction Industry Licensing Board was subjected to extensive public criticism originating from members of the regulated trades, the press, trade associations, the Auditor General, and some legislators. The examinations prepared by board and staff were severely attacked as anti-competitive due to unreliable content and too few applicants receiving passing scores. From the first examinations . . . in 1967 through the first examination in 1974 . . . all examinations were prepared, duplicated, administered, graded, evaluated, and secured by board members and staff. Following extensive public criticism of the security breach of one exam and the questionable validity of another, the Legislature amended the law requiring all examinations to "be prepared by an independent testing agency, subject to approval of the respective division of the board . . . A passing grade . . . is 70 percent and such examinations shall be administered by the independent testing service." (sec 468.106(2)) In 1973, the Legislature enacted requirements for privately-prepared and administered examinations. The board was criticized for accepting the allegedly least qualified bidder, whose bid was slightly higher than others. Further criticism grew from the hiring of the testing firm's vice-president

as executive director. The executive director subsequently resigned his position with the firm but retained his corporate holdings. The board reportedly hired this man, . . . James Linnan, at the Governor's direction following a history of allegedly incompetent and dishonest predecessors. (SGOC, 1978, p. 26)

The Committee reported, however, that from late 1974 through mid-1978 the FCILB's administration had steadily improved in all areas of criticism, including validity and reliability of examinations. Examinations were still prepared, administered, graded, and evaluated by private testing firms. The validity and reliability of the exams have been upheld by subsequent administrative hearings and subsequent court appeals (SGOC, 1978).

The agreement with the independent testing service details the responsibilities of the testing service and the FCILB relative to the preparation, administration, and grading of examinations, and to the statistical analysis and reporting of results. The FCILB established the subject-matter requirements in each category, and the testing service, in consultation with recognized industry experts, prepares the examinations.

The examinations are presented to the board's testing/education specialist, who discusses the examination with appropriate board members. The specialist's services include reviewing examinations, doing statistical analyses, making recommendations in regard to scores presented by the professional testing

service, and advising the board on these matters (SGOC, 1978).

As a result of the Regulatory Reform Act of 1976, an examination of the law and its enforcement was made. The committee evaluating the construction industry regulatory process made the following statements:

1. The total absence of regulation would definitely endanger the public health, safety, and welfare.
2. Due to the inconsistency of local regulation and the closed shop situations in some areas, the public welfare is served beneficially by the current method of state-level regulation. State-level regulation provides consistent enforcement of the laws to all trades in both types of licenses.
3. There is a reasonable relationship between the exercise of the state's police power in regulating these trades and the protection of the public from potential harm.
4. Although state regulation was found to increase consumer costs a small amount, the potential for increased competition provided in certification probably offsets these costs in the final analysis.
5. All facets of the regulatory process are not designed solely to protect the public. The statewide certification does work to the benefit of contractors by allowing them to enter markets which were difficult to enter.
6. The industry and the public also benefit somewhat from the deterrent effect of the law's penalties and the enforcement by the board. State-level regulation provides a level of consistency to regulation of the industry which does not exist at the local level. (SGOC, 1978, pp. 7-9)

Specifically in relation to the examination, the committee stated "the certificate requirements provide an acceptable degree of competency of each company's certified qualifier by examining his aptitude and capability to apply appropriate codes and to administer his business legally and efficiently" (SGOC, 1978, p.72). The public was most likely to be harmed financially by losses resulting from poor workmanship, diversion of funds, and not completing contracts (SGOC, 1978).

The following six criteria were used for the sunset review conducted in 1987:

1. Would the absence of regulation significantly harm or endanger the public health, safety, or welfare?
2. Is there a reasonable relationship between the exercise of the police power of the state and the protection of the public health, safety, and welfare?
3. Is there a less restrictive method which would adequately protect the public?
4. Does the regulation have the effect of directly or indirectly increasing the costs of any goods or services, and if so, to what degree?
5. Is the increase in the cost more harmful to the public than the harm which could result from the absence of regulation?
6. Are there facets of the regulatory process designed for the purpose of benefitting, and do they have as their primary effect the benefit of, the regulated entity? (SECCAC, 1987, p. 101)

Note the similarities to the conclusions from the previous sunset review. The report produced by the sunset review conducted in 1987

concludes that the regulation is necessary for the protection of the public health, safety, and welfare. This conclusion was based on the potential for both physical and economic harm that could result from incompetent, dishonest, or fraudulent contractors. The cost and benefits of regulation to the public and the industry were discussed, and it is concluded that for both the benefits of regulation outweigh the costs. It's also determined that the regulation is not unduly restrictive, and, in fact, that regulation on both the state and local level is a less restrictive alternative that adequately protects the public. (SECCAC, 1987, p. 5)

Competency examination

Applicants for contractor licensing in Florida must take and pass the Florida Certified Contractor's Examination. Figure 2.2 shows an outline of this competency examination process.

The Florida Certified Contractor's Examination was designed following the testing standards developed by the American Psychological Association. The examinations are "open book," and a list of approved materials which can be brought to the exam site is given to each examinee (Senate Governmental Operations Committee, 1978). Following APA standards, the contract with the testing agency requires that examinations be statistically analyzed for reliability and validity. In their 1978 review of the examination analysis printout, including item analyses in

each category, ease index and examinees' aptitude profiles, the Senate Governmental Operations Committee found that the examinations were reliable and valid (SGOC, 1978).

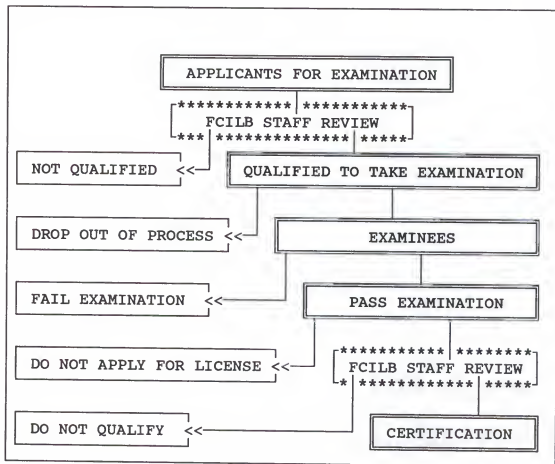


Figure 2.2. Florida Competency Examination Process.

Task analysis. "Licensing exams . . . should be designed to identify those who possess the knowledge, skills, and abilities to perform critical tasks in a

manner that will adequately safeguard the public welfare" (Young, 1987, p. 38). At the direction of the Office of Examination Services in the Florida Department of Professional Regulation a survey and task analysis study was done by American Community Services, Inc. (ACSI). The final report was completed in December 1985. The stated purpose of the survey and analysis was "to determine the most current trade, business and financial tasks and knowledge required of a contractor practicing in the State of Florida" (ACSI, 1985, p. 1). Basing the contractor licensing competency examination on a task analysis assured that those who pass the examination can perform the task performance/knowledge competencies judged to be those needed to protect the welfare and safety of the public.

Using results of a survey developed through interviews and site visits with contractors, and findings of research of the construction industry as validated by the members of the CILB, DPR specialists, and by a pilot survey, ACSI (1985) did a matrix sampling of the three prime contractor groups using four different questionnaires. A set of contractor profile questions was common to all questionnaires.

The survey data validated the four distinct task/knowledge categories represented in the questionnaires as being the general areas of important tasks and required knowledge. The category areas are:

Business Administration - General business administration tasks and knowledge which are common to most businesses.

Financial Administration - General financial administration tasks and knowledge which are common to contracting type businesses.

Contract Administration - Administrative tasks and knowledge required for the day-to-day workings of a construction firm.

Project Management - Tasks and knowledge dealing with the management of individual project. Included in this category is the knowledge of trade areas (construction materials, tools, equipment and methods). (ACSI, 1985, p. 4)

Contractors in all categories responded with the following possible reasons for construction contracting business failure, in descending order of frequency: lack of general business knowledge and skills, lack of financial knowledge and skills, lack of cash and credit, and lack of contracting business knowledge and skills (ACSI, 1985).

Tasks and the specific knowledge bases related to them were grouped into business administration, financial administration, contract administration, and project management categories. The survey asked for responses to both the frequency (how often the task was done) and the importance of each task. A sample page of the survey is provided in Appendix A. To obtain a weighting for task items and knowledge items, a matrix was developed for each category. A sample matrix for general contractor contracting administration is provided in Appendix A.

Total row or column weights were combined with the frequency and importance products to obtain "weighted task rankings" and "weighted knowledge rankings" (ACSI, 1985, p. 8). Tables showing the resulting ranks are included in Appendix A. Using these rankings as a guide, test items could be developed for the contractor licencing exams.

Examination revision. When in 1985 the FCILB realized that the contractors coming before it for disciplinary action were often lacking in financial and business expertise and, due to this incompetence, were causing harm to the public, they requested the legislature to authorize funds to hire a consultant to perform the task analysis and knowledge survey among practicing members of the construction industry described in the previous section. As a result of this research, the exam format has been changed.

Under the previous grading method, an examinee scoring well in one area could compensate for lack of ability in another. As indicated in the findings of the Senate Governmental Operations Committee,

we find that the examinee with many years of experience fares better on estimations and take-offs than do younger examinees with formal education, whereas the reverse is true on the short, book questions involving law, safety, administration procedures, and technical material. Therefore, in the weighting of examinations, the former balances the latter. (SGOC, 1978, p. 63)

The recent changes in the examination included implementing a new multiple cutoff scoring method for determining which examinees pass the exam.

The multiple cutoff model . . . assumes that a minimum passing score is set for each predictor so that a candidate is not considered to pass unless he achieves at least the minimum score on each of the predictors; in this model, a lack of talent in one area cannot be compensated for by a superior level of talent in another area. (Quirk, 1974, p. 318)

Summary

A basic knowledge of the underlying theory and applications in professional regulation and licensing processes is important to the understanding of construction industry regulation through contractor licensing. Chapter II included a review of the literature regarding general professional regulation through contractor licensing in the United States as well as a detailed review of the Florida contractor licensing process. The measurement and testing process is presented in Chapters III and IV and the model is developed in Chapter V.

CHAPTER III METHODOLOGY

Introduction

The purpose of this research was to test whether the obligation of government to protect the public from harm resulting from actions of prime contractors was being met by the regulation of contractors through competency examination licensing processes. As a natural corollary, the researcher designed a licensing model after an analysis of the state contractor licensing process as practiced in the United States and the competency examination process as illustrated by the Florida Contractors Examination. This research was carried out in three phases.

First, in order to find measures of effectiveness of the construction licensing processes performed through state agencies, the areas of harm between the public and prime contractors were identified, and data on these levels of harm were examined. The public with whom contractors interact was divided into three groups: employees/subcontractors, clients, and the general public. Each group could be harmed by the contractor, but in different ways. Employees could be physically injured on

the job as a result of actions or negligence of the contractor. Employees and subcontractors could be harmed financially by a contractor's non-payment for services. Clients could be harmed financially by the contractor's not paying his employees and subcontractors, by his abandoning the job, by his failing as a business, or by his delaying the client's project or leaving it incomplete. Clients could be financially harmed after a job has been completed because of poor workmanship needing correction. The general public could be physically or financially harmed by the contractor in the course of performing his everyday business operations on his own premises or at jobsite locations. These harm situations are listed in Table 3.1 along with the vehicle for restitution for the harm and, if appropriate, an indirect measure of the level of harm.

All of the measures of harm were proxies for the actual harm suffered by the public. To be selected as a measure for use in this research, comparable data specifically relating to prime contractors had to exist for most of the 50 states. Court records and case dispositions did not meet this criteria. In addition to the above measures, the following were used in the analysis (but not in the findings) even though they failed to meet the criteria:

Table 3.1

Contractor/Public Harm Situations

1. PHYSICAL INJURY TO EMPLOYEES	
Restitution	Measure
Worker Compensation	Worker compensation insurance Rates Injury Incidence Rate
Civil Court Liability	-court case measures between states are inconsistent
2. FINANCIAL HARM TO EMPLOYEES AND SUBCONTRACTORS	
Restitution	Measure
Lien Laws in Civil Courts (Partial shifting of harm to client)	Lien Bond Loss Ratio -court measures inconsistent
3. FINANCIAL HARM TO CLIENTS (liens, abandonment)	
Restitution	Measure
Civil & Criminal Courts Liability - Fraud	Contract bond loss ratio Business failure rate -court measures inconsistent
Contract Bond	-contractor (only) fraud rate not available
4. FINANCIAL HARM TO CLIENTS (completed operations)	
Restitution	Measure
Civil Courts Liability Insurance	Completed operations insurance premium rate
Third Party Warranties	-No prevalent measure

Table 3.1--continued.

5. PHYSICAL OR FINANCIAL HARM TO GENERAL PUBLIC	
Restitution	Measure
Civil Courts Liability Insurance	Premises and Operations Insurance premium rate

1. license bond loss ratio, which was inconsistent in that it included both state and local licensing, and

2. bid bond loss ratio, which was applied only to the competitive bid situation where the low bidder refused to sign the contract with the owner and therefore would only indicate incompetency in bidding. High loss ratios (without recoveries) might indicate, indirectly, business failure due to incompetency in bidding.

A major criterion for enactment of licensing laws or professional regulation was incompetence of practitioners as a source of harm, but three relevant conditions must be proven to satisfy the criterion: (a) there should be reasonable agreement as to what causes harm, (b) the causes of harm must relate to professional functioning, and (c) adequate mechanisms for identifying those who were causing harm must exist. If there was no consensus as to the causes of harm, then reducing these dangers through

licensing laws was unlikely. If the causes of harm were related to external factors such as environment or clients, then, because the causes were uncontrollable, professional regulation could be expected to have little impact on the incidence of harm. If a link can be established between causes of harm and professional practice, a reliable way of identifying those who are causing harm must exist for regulation to perform as intended (Hogan, 1979). The Hawaii sunset review committee stated the case for contractor licensing:

Occupational licensing cannot be justified unless it reasonably protects the consumers from the identified potential harm. If the potential harm to the consumer is physical injury arising from possible lack of competence on the part of the provider of service, the licensing requirement must ensure competence of the provider. If, on the other hand, the potential harm is the likelihood of fraud, the licensing requirements must be such as to minimize the opportunities for fraud. (HLA, 1983, p. 5)

Feature data regarding individual state licensing system were gathered by telephone interview for those states that license prime contractors. Phase one included tests of hypotheses based on the relationship between harm levels and licensing features. The focus in phase one was on the interaction between licensing agencies, practicing prime contractors, and the public. The main licensing feature, competency examination, was used as a grouping criterion for licensing versus nonlicensing. Subsequent analyses supported the importance of this grouping

criterion, and indicated which licensing features were most effective in reducing risk to the public.

Considering only the states that have licensing statutes, the researcher performed regression analyses to determine the licensing features having effects on the performance variables. The performance of licensing in reducing harm to clients and employees was shown by the regression results from the testing of Hypothesis 16. This hypothesis was designed to determine whether the licensing agency features, competency examination, task analysis base for examination, disciplinary process, power to revoke, liability insurance, license bond, and public information availability were equally effective in reducing levels of harm to the public.

The second phase focused on the feature the researcher felt was the most important aspect of the admissions function, the competency examination. Those educational and experience attributes most correlated to successful entry into the industry through passing a contractor's examination were determined through a detailed analysis of responses to a questionnaire distributed to those taking the October 1987 Florida Contractors Licensing Examination. The Florida examination was chosen because it was based on task analysis. This examination was widely viewed as representative of good examination practice. Because of the importance of construction in Florida, the state has a

long record in contractor licensing. The findings of phase two are presented in Chapter IV.

During the third phase, the results of the licensing performance phase, the examinee attribute phase, and the findings reported in the literature search were synthesized into a model for contractor licensing. The model is presented separately in Chapter V.

Performance of Licensing

General Research Design

State licensing of contractors has been established by state governments largely on the assumption that the regulatory agencies could effectively protect the public welfare through exercising of administrative and quasi-judicial powers in the admission of applicants into the contracting practice and through disciplining of practicing contractors who have harmed the public. Increasingly, this assumption has been questioned. Disciplinary processes and registration only were shown to be ineffective in various states' reviews of their contractor licensing boards. No studies have been found dealing with the overall effectiveness of contractor licensing.

Measures of harm to the public were the dependent variables in step one of the phase one analysis. The search for measures of harm to the public led the researcher to worker compensation rates, construction business failure rates, occupational injury incidence

rates, contractor liability insurance rates, and a series of surety bond levels of harm indicators.

The independent variables were the features of contractor licensing processes. These variables were obtained through telephone interviews with licensing agencies and through analysis of state licensing laws.

Instrumentation

The independent variables were selected from data gathered from the Licensing Agency Interview Sheets as shown in Appendix B. The questionnaire items were selected by the researcher from licensing features that were indicated in the literature search.

Performance measures were selected on the basis of their ability to measure level of harm between prime contractors and some identifiable public group as indicated above. Those insurance and bond types applicable to a relationship between prime contractors and a public group were selected. From these measures, state aggregate insurance rates that were not based on common risk or rate determination factors were deleted from the specific analysis. Bond measures were calculated from data provided by The Surety Association of America, Inc., and insurance measures were calculated from data provided by Insurance Services Office, Inc. Other performance measures were found in industry publications.

Subjects

The subjects of this phase of the analysis were the 50 states of the United States, of which 24 license prime contractors. Of these 24 licensing states, 16 currently require contractors to pass a competency examination. Data were collected for all 50 states. The researcher conducted a census of the subjects rather than a sampling.

Data Collection

The licensing features were collected by telephone interviews with the staff members of each state licensing agency and from published materials supplied by the agencies. The completed Licensing Agency Interview Sheet was copied and sent to the subject agency for verification and/or completion. Several corrections were made at this time. The first nine values after each state abbreviation in the table shown in Appendix C are the licensing data.

The harm level and performance measures were obtained from insurance and surety association data, construction industry periodicals, and government publications. The harm level and performance data are shown following the licensing data for each observation in the table shown in Appendix C.

Data Analysis

The statistical analysis computer software used for data analysis in this research was the SAS Statistical

Analysis System produced by SAS Institute, Inc., Cary, North Carolina.

Phase one analysis consisted of comparison of means for different groupings of states. Since a census of all states was obtained, statistical testing was not appropriate. The test criterion used in this phase of the research was that a difference between group harm level or performance was meaningful if the difference in means was one-half or more standard deviations. Performance data were calculated as a percentage reduction in harm level. A difference of 25% between group means was reported as meaningful.

Anticipated Findings and Implications

The researcher anticipated finding that licensing itself without a competency examination was not sufficient to reduce harm, but that licensing with a competency examination requirement would result in lower levels of harm as measured by lower insurance rates, injury incidence, and bond loss ratios. It was anticipated that over the selected six-year time period the change in injury incidence rates, lien bond loss ratios, and contract bond loss ratios would be meaningfully different between the licensed with examination group and the nonlicensed group.

The researcher anticipated that task analysis and power to revoke should have been stronger in producing better performance than the examination requirement or the

disciplinary process. The researcher did not expect the license bond and insurance requirement to have much effect on performance. Examination, task analysis and the minimum years of experience requirement were expected to show a strong effect.

Examinee Attributes

General Research Design

This research is important to those people who aspire to be contractors and to the people who educate them. Sweet (1985) stated that one purpose of licensing laws is to provide the public with some assurance that those with whom they deal have at least minimal competency and integrity. To accomplish this end, governments require those who wish to join the profession to have specific kinds of education and experience and to pass examinations to demonstrate competence. If the competency examination is shown to be an effective factor in the performance of contractor licensing, then it is important to know how the competency examinations affect the pool of contractors allowed to practice construction in the state. Phase two of this analysis identified the differences between applicant and passing groups for a typical contractor licensing examination.

Many four-year professional construction education programs have had no apparent focus on the licensing process in general or on licensing examinations

specifically. The function of education has been to prepare practitioners for active competent involvement in the construction industry and to improve their abilities throughout their careers in the industry. Educators in construction-related professional programs as well as the applicants for the examinations have needed to know to what extent educational level, college degree, and years of experience correlate with success on this examination. Applicants for contractor certification have needed to know what individual attributes are predictive of success on the licensing examination. They have been particularly interested in those attributes over which they have control. The phase two analysis concentrated on these attributes.

Educators in construction and construction-related fields also need to know what applicant attributes are predictive of success on contractor examinations. They could use this new information to counsel students in their programs and to analyze the effectiveness of curriculums in teaching the competencies tested by the examinations. This research ascertained which attributes of members of a population of examinees were related to success on the examination.

The population to be studied was limited to those applicants who wanted to be certified in Florida as general, building, or residential contractors. The initial

contact was made with the Florida Construction Industry Licensing Board, located in Jacksonville. The FCILB maintained records on all applicants for the Florida Certified Contractor's Examination. Some of the information in the physical files such as examination scores, credit reports, and financial statements was confidential and therefore not available to the researcher. The Florida examination was developed by American Community Services, Inc. (ACSI), which is one of the two major consulting firms to construction industry licensing boards for examination preparation.

Instrumentation

Two instruments were fundamental to phase two of the research, the Certified Contractor's Examination and the Department of Professional Regulation Examination Survey Form. The Certified Contractor's Examination is classified and not available for study. The general structure, however, is public information and is discussed in the following paragraphs. The Department of Professional Regulation Examination Survey Form was given to the group taking the Division I Certified Contractor's Examination in October 1987. These forms were completed at that time and given to the examination proctors. A copy of that survey form is included in Appendix E.

Starting in June 1987, there were three parts to the examination: business and financial management, contract

administration, and project management. The applicant must pass each part with at least a 70% in order to pass the examination. An applicant passing any part of the examination does not have to retake that part if he/she can pass the remaining part(s) over the next two successive examinations (see Appendix D). Prior to that time, an applicant had only to receive an overall 70% grade on the examination.

As the minutes of the April 11, 1986, meeting of the FCILB indicate, the proposed new examination format was divided into three parts:

Part I Section A	40 questions	4 hours
Section B	40 questions	4 hours
Part II	40 questions	4 hours
Part III	40 questions	4 hours

Part I, Section A, is the business administration section testing general business management ability, including insurance, record keeping, business law, and state/federal laws and rules. Part I, Section B, is the financial administration section testing general financial knowledge necessary to manage a business, including fiduciary responsibility, cash management, and other financial management competencies. Part II is the contract administration section testing knowledge of day-to-day operations of a construction firm. Part III is the project management section testing knowledge in the area of control

and management of the individual construction project (Fred L. Seely, Executive Director of Florida Construction Industry Licensing Board, personal communication, May 1987).

The reference book list for the examination included the following books not on previous lists (also see Appendix D):

Builder's guide to accounting, Thomsett.
Carlsbad, CA, Craftsman Book Co., 1979.

Carpentry, Koel. Aslip IL, American Technical Publishers, 1985.

Construction contracting, Clough (5th ed.). New York, John Wiley & Sons, 1986.

Florida construction law manual, Leiby.
Shepard's/McGraw-Hill, 1981 (with cumulative supply through 1985).

Handy reference guide to the fair labor standards act, U.S. Department of Labor, Employment Standards Administration, WH Pub 1282, revised 6/83.

Information for business taxpayers, Internal Revenue Service, Pub 583.

Mechanical and electrical systems in construction and agriculture, Dogostino.*

Overtime compensation under the fair labor standards act, U.S. Department of Labor, Employment Standards Administration, WH Pub 1325, revised 4/85.

Principles and practices of heavy construction, Smith and Andres, 3rd ed.*

The following American Institute of Architects publications were also included:

A305, Contractor's Qualification Statement *

A401, Standard Form of Agreement Between Contractor
and Subcontractor

A701, Instructions to Bidders *

G701, Change Order

G702 & G703, Application and Certificate of Payment

G705, Certificate of Insurance *

G706, Release of Lien

*general and building contractor classifications only.

Subjects

This phase of the research focused on the population of Certified Contractor's Examination (Division I) examinees. This group was both the product of the educational process and, if successful on the examination, the object of regulation. Only through the process of passing the Certified Contractor's Examination did members of this population become eligible for certification and subsequently replenish the supply of industry contractors. Figure 3.1 shows this population and its subsets.

The sample selected for analysis included all examinees taking part in the October 1987 Division 1 (prime contractors) Florida Certified Contractors' Examination. These subjects affirmed that they were at least 18 years of age, were of good moral character, had paid the \$175 examination application fee, and had a credit report sent

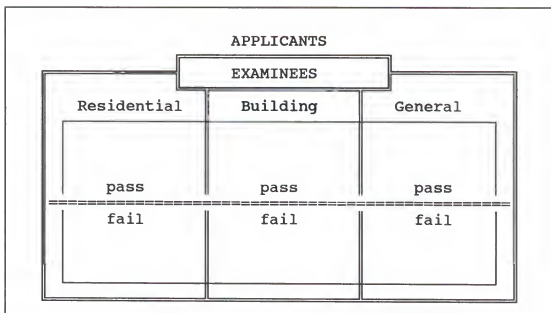


Figure 3.1. Examination Applicant Diagram.

to the Florida Construction Industry Licensing Board by a nationally recognized credit agency. In addition, they satisfied the years of experience requirements for the particular contractor category for which they applied. Formal education could substitute for part of the experience requirement as indicated. The years of experience requirements could be satisfied in any of the following ways (see Appendix D):

1. have an engineering, architecture, or building construction degree from an accredited four year college and have one full year of proven experience in his/her category.
2. have at least three years of experience as a skilled workman (mechanic) in his/her trade and have one year at the level of foreman in charge of a group of workmen.

3. have a combination of not less than one year as a foreman and not less than three years of credits from any accredited college-level courses; or two years of experience as a skilled workman, one year as a foreman, and not less than one year of credits from any accredited college.

There are additional requirements by trade:

General contractors must have a minimum of one year of structurally-related experience on buildings of four or more stories.

Building contractor must have a minimum of one year of structurally-related experience in construction of commercial or industrial buildings, or multiple dwelling residential buildings, up to three stories.

Residential contractors must have a minimum of one year of structurally-related experience in residential construction.

Data Collection

The examinee attribute data were provided in raw data form by the State of Florida Department of Professional Regulation in electromagnetic media form. The raw data corresponded with 1396 examinee responses to the questions on the survey form shown in Appendix E.

Data Analysis

Analysis of the responses to the survey form found in Appendix E focused on testing for differences between passing, failing, and all-examinee groups in level of education, college degree, and years of experience. Frequency tables were developed and chi-square tests with alpha equal to .05 were performed to test for independence of variables or proportionality differences between groups.

Anticipated Findings and Implications

Significant differences were expected between passing groups and all-examinee groups in level of education and years of experience. Those applicants with higher levels of education were expected to do better on the October 1987 examination. A strong effect of more years of experience subcategories on passing score would seem logical, but the researcher expects the individuals with 0-6 and 7-12 years of experience to have a higher passing rate.

A significant difference between the level of education and years of experience was expected between the all-examinee group and the passing group.

CHAPTER IV FINDINGS

Success of Licensing

Analysis and Results

Variables

The independent variables for the harm and performance analysis included one identifying variable and nine licensing feature variables. The identifying variable was state abbreviation. The licensing feature variables were developed from the licensing agency questionnaire data. The independent variables are listed below and in Appendix C.

One of the objectives of the research was to determine the causes of differences in the dependent variables. Differences among states in liability insurance rates, bond loss ratios, injury and death incidence rates, and construction industry business failures may be caused by factors other than those controllable through a licensing process. Two additional alternative variables, lawyer density and fraud rate, are listed after the licensing agency independent variables.

The two types of dependent variables were harm measures and performance measures. The 11 construction industry harm measures were the most current data available. The three performance measures were determined by comparison of three harm measures: contract bond loss ratio, lien bond loss ratio, and injury incidence rate over a period of time. Variables for harm and performance are as follows:

Harm

ST = State identification
 L = Licensing
 E = Examination
 D = Disciplinary feature
 Y = Years of experience requirement
 B = License bond requirement
 I = Public liability insurance requirement
 T = Task analysis base for examination
 R = Agency power to revoke license
 P = Public information index
 LD = Lawyer density
 FR = Fraud rate
 II = Injury incidence rate
 WC = Worker compensation composite rate
 CB = Contract bond loss ratio
 BB = Bid bond loss ratio
 LB = License bond loss ratio
 LN = Lien bond loss ratio
 GP = General contractor premises & operations
 insurance premium rate index
 GC = General contractor completed operations
 insurance premium rate index
 RP = Residential contractor premises &
 operations insurance premium rate
 index
 RC = Residential contractor completed operations
 insurance premium rate index
 BF = Business failure rate

Performance

PI = Percent change in injury incidence
 PC = Percent change in contract bond loss ratio
 PN = Percent change in lien bond loss ratio

Procedure

Preliminary to testing any hypotheses the standard deviations of all harm level and performance dependent variables were calculated for each group without the feature. These control group standard deviations are found in Table 4.1. The indicator of a meaningful difference in level of harm means between groups was one-half of a standard deviation. A precedent for choosing a fractional part of standard deviation as the criteria for decision making when statistical measures are inappropriate was found in Statistical Analysis with Missing Data (Little, 1987) where 0.35 of a standard deviation was used to assert that one group had lower scores than another. If the difference in means for a dependent variable between the feature group and control group was greater than one-half of a standard deviation, the difference was meaningful for this research. For example, the standard deviation of the injury incidence variable was 2.38 for states without examination. The means for states with and without examinations were 15.36 and 15.05, respectively. Because this difference (.31) was less than half of the standard deviation ($.5 \times 2.38$), the difference between the two groups was not considered meaningful.

Means were calculated for all of the harm level variables for dichotomous levels of every licensing

feature variable. All means are shown in Table 4.2. Table 4.3 includes only those variable means with meaningful differences.

Table 4.1

Harm Measure Standard Deviations for Control Groups

	E	L	Y	R	T	P	I	B
II	2.38	2.46	2.34	2.55	2.29	2.38	2.32	2.30
WC	5.23	5.42	5.16	5.27	5.11	5.22	4.97	5.16
LN	0.44	0.49	0.53	0.46	0.44	0.47	0.52	0.53
CB	0.69	0.74	0.76	0.71	0.88	0.72	0.81	0.81
BF	45.77	50.65	43.70	48.40	44.65	49.71	43.04	43.99
GC	0.80	0.75	0.77	0.78	0.80	0.72	0.70	0.70
RC	0.90	0.94	0.93	0.93	0.94	0.92	0.88	0.89
GP	0.95	0.96	0.93	0.91	0.93	0.93	0.90	0.93
RP	0.95	0.86	0.93	0.82	0.94	0.83	0.94	0.96
LB	0.52	0.59	0.49	0.56	0.51	0.57	0.47	0.49
BB	3.88	3.39	3.64	3.26	3.78	3.30	2.77	2.86
LD	0.60	0.60	0.60	0.58	0.58	0.59	0.61	0.64
FR	127.3	107.5	150.2	103.0	126.7	109.4	152.0	145.7
PI	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.11
PN	0.23	0.26	0.22	0.11	0.23	0.25	0.67	0.23
PC	1.31	0.87	1.30	0.99	1.29	0.98	1.82	1.36

II=injury incidence, WC=worker compensation, LN=lien bond l.r., CB=contract bond l.r., BF=business failures, GC=completed operations insurance(gen.), RC=completed operations insurance(res.), GP=premises & operations insurance(gen.), RP=premises & operations insurance(res.), LB=license bond l.r., BB=bid bond l.r., LD=lawyer density, FR=fraud rate, PI=injury incidence performance, PN=lien bond l.r. performance, PC=contract bond l.r. performance.

E=examination, L=licensing, Y=minimum years of experience, R=power to revoke, T=task analysis base for exam, P=public information, I=public liability insurance, B=license bond

Table 4.2

Harm Level Means by Feature Existence

Feature	Measures of Level of Harm							
	FREQ	II	WC	LN	CB	BF	GC	RC
E 0	34	15.05	11.85	0.08	0.49	58.35	0.03	0.07
1	16	15.36	12.31	0.15	1.15	66.25	-0.06	-0.14
L 0	26	14.77	11.65	0.06	0.58	61.54	-0.18	-0.03
1	24	15.49	12.42	0.14	0.83	60.17	0.19	0.03
Y 0	39	14.71	11.49	0.15	0.58	59.23	0.02	0.02
1	11	16.35	13.70	-0.07	1.12	66.73	-0.07	-0.07
R 0	29	15.18	11.58	0.07	0.55	62.24	-0.08	0.08
1	21	15.19	12.59	0.15	0.91	59.00	0.11	-0.12
T 0	36	15.02	11.63	0.10	0.48	59.25	0.02	0.04
1	14	15.46	12.88	0.12	1.26	65.07	-0.06	-0.10
P 0	28	14.65	11.65	0.06	0.56	59.04	-0.17	-0.03
1	22	15.66	12.50	0.16	0.88	63.23	0.21	0.03
I 0	42	14.63	11.12	0.12	0.72	59.05	0.02	0.12
1	8	17.27	16.51	0.01	0.62	70.50	-0.10	-0.63
B 0	38	14.57	11.16	0.14	0.71	60.82	-0.04	0.03
1	12	16.70	15.17	-0.02	0.66	61.08	0.13	-0.09

Feature	Measures of Level of Harm					
	GP	RP	LB	BB	LD	FR
E 0	0.14	0.17	0.09	1.32	2.51	133.09
1	-0.31	-0.37	0.11	0.38	2.31	193.63
L 0	0.13	0.12	0.07	0.93	2.46	118.23
1	-0.15	-0.13	0.13	1.12	2.42	189.54
Y 0	0.11	0.10	0.09	1.22	2.45	148.77
1	-0.42	-0.37	0.12	0.33	2.44	165.55
R 0	0.15	0.13	0.08	1.05	2.47	113.00
1	-0.22	-0.18	0.12	0.99	2.40	206.95
T 0	0.12	0.14	0.09	1.26	2.50	137.47
1	-0.31	-0.38	0.11	0.42	2.30	191.00
P 0	0.14	0.10	0.08	0.98	2.49	123.82
1	-0.19	-0.14	0.12	1.07	2.39	188.91
I 0	0.09	0.10	0.09	0.64	2.40	153.17
1	-0.48	-0.55	0.13	3.03	2.69	148.75
B 0	0.16	0.09	0.08	0.78	2.42	145.50
1	-0.48	-0.28	0.16	1.80	2.53	174.50

II=injury incidence, WC=worker compensation,
LN=lien bond l.r., CB=contract bond l.r., BF=
business failures, GC=completed operations
insurance(gen.), RC=completed operations
insurance(res.), GP=premises & operations

Table 4-2--continued.

insurance(gen.), RP=premises & operations insurance(res.), LB=license bond l.r., BB=bid bond l.r., LD=lawyer density, FR=fraud rate, PI=injury incidence performance, PN=lien bond l.r. performance, PC=contract bond l.r. performance.

E=examination, L=licensing, Y=minimum years of experience, R=power to revoke, T=task analysis base for exam, P=public information, I=public liability insurance, B=license bond

Row identification: 0=feature does not exist,
1=feature exists

The hypotheses were not tested consecutively. The order of data analysis dictated the order of hypothesis testing. Hypothesis 1 was tested first. Hypotheses 2, 4, 6, and 8 were tested consecutively, since the licensing state grouping definition for these hypotheses was the same. Hypotheses 3, 5, 7, 9, 10, 11, and 12 were tested in that order, since the licensing state grouping definition for these hypotheses was the same. Hypotheses 13, 14, and 15 were tested consecutively and independently from the other hypotheses because they were based on a totally different data set. Hypothesis 16 was tested as a prelude to model development (see Chapter V).

Hypothesis 1, "there was no relationship between state contractor licensing agency features and levels of harm," was rejected. Meaningfully greater harm levels occurred with the existence of some of the licensing agency features.

Higher injury incidence rates, II, were shown for the existence of the features Y, years of experience requirement (existing-not existing/standard deviation) (16.35-14.71/2.34); I, liability insurance requirement (17.27-14.63/2.32); and B, license bond requirement (16.70-14.57/2.30). Higher worker compensation insurance rates were shown for the existence of I, the liability insurance requirement (16.51-11.12/4.97) and B, the license bond requirement (15.17-11.16/5.16). Higher contract bond loss ratios, CB, were shown for the existence of E, the examination feature (1.15-0.49/0.69); Y, years of experience requirement (1.12-0.58/0.76); R, the revocation feature (0.91-0.55/0.71); and T, the task analysis base feature (1.26-0.48/0.88) for the examination. A higher bid bond loss ratio was found for the existence of I, the liability insurance requirement (3.03-0.64/2.77). The alternative explanatory factor FR, fraud rate, was higher for the existence of L, the licensing statute feature (189.54-118.23/107.50); P, the public information availability feature (188.91-123.82/109.40); and R, the revocation feature (206.95-113.00/103.00) in the disciplinary process. A higher general contractor completed operations composite insurance rate was found for the existence of P, the public information availability feature (0.21-(-0.17)/0.72). All of these results seem to run counter to the premise that licensing reduces harm. The high levels of harm existed

Table 4.3

Mean Levels of Harm for Groups with Meaningful Differences on Features of Interest

Feature	FREQ	II	Measures of level of harm					RC
			WC	LN	CB	BF	GC	
E 0	34				0.49			
1	16				1.15			
L 0	26							
1	24							
Y 0	39	14.71			0.58			
1	11	16.35			1.12			
R 0	29				0.55			
1	21				0.91			
T 0	36				0.48			
1	14				1.26			
P 0	28						-0.17	
1	22						0.21	
I 0	42	14.63	11.12					0.12
1	8	17.27	16.51					-0.63
B 0	38	14.57	11.16					
1	12	16.70	15.17					

Feature	GP	RP	LB	BB	LD	FR
E 0	0.14	0.17				
1	-0.31	-0.37				
L 0						118.23
1						189.54
Y 0	0.11					
1	-0.42					
R 0						113.00
1						206.95
T 0		0.14				
1		-0.38				
P 0						123.82
1						188.91
I 0	0.09	0.10		0.64		
1	-0.48	-0.55		3.03		
B 0	0.16					
1	-0.48					

II=injury incidence, WC=worker compensation,
 LN=lien bond l.r., CB=contract bond l.r., BF=
 business failures, GC=completed operations
 insurance(gen.), RC=completed operations
 insurance(res.), GP=premises & operations

Table 4.3--continued.

insurance(gen.), RP=premises & operations insurance(res.), LB=license bond l.r., BB=bid bond l.r., LD=lawyer density, FR=fraud rate, PI=injury incidence performance, PN=lien bond l.r. performance, PC=contract bond l.r. performance.

E=examination, L=licensing, Y=minimum years of experience, R=power to revoke, T=task analysis base for exam, P=public information, I=public liability insurance, B=license bond

with the licensing feature. If high levels of harm were considered the cause for licensing, and licensing had not yet worked to bring down levels of harm, the observed results would be logical. The reduction of levels of harm was the key to evaluation of the effectiveness of licensing as was shown with the testing of Hypotheses 10, 11, and 12.

For several harm measures, lower harm levels occurred with the existence of licensing agency features. A lower residential contractor completed operations composite insurance rate was found for the existence of I, the liability insurance requirement (-0.63-0.12/0.88). A lower general contractor premises and operations composite insurance rate was found for the existence of Y, years of experience requirement (-0.42-0.11/0.93); I, liability insurance requirement (-0.48-0.09/0.90); and B, license bond requirement (-0.48-0.16/0.90). A lower residential contractor premises and operations composite insurance rate

was found for the existence of E, the examination feature (-0.37-0.17/0.95); Y, years of experience requirement (-0.37-0.10/0.93); T, the task analysis base feature (-0.38-0.14/0.94); and I, liability insurance requirement (-.055-0.10/0.94).

The grouping of licensing based solely on whether a licensing statute existed in the state as of 1988 resulted in only one meaningful difference in levels of harm between groups. This was the alternative explanatory variable FR, fraud rate. The means for harm level and performance variables for the new grouping are shown in Table 4.4.

Hypothesis 2, "there was no difference between the licensed and nonlicensed contractor groups as measured by the level of employee injury incidence rates or worker compensation insurance rates," was not rejected. The differences in injury incidence rate means (15.49-14.77/2.46) and worker compensation insurance rate means (12.42-11.65/5.42) between licensed and nonlicensed groups were not greater than one-half of a standard deviation.

Hypothesis 4, "there was no difference between the licensed and nonlicensed contractor groups as measured by the level of lien bond loss ratios," was not rejected. The difference in lien bond loss ratio means (0.14-0.06/0.59) between licensed and nonlicensed groups was not greater than one-half of a standard deviation.

Hypothesis 6, "there was no difference between the licensed and nonlicensed contractor groups as measured by business failure rates or level of contract bond loss ratios," was not rejected. The differences in business failure rate means (60.17-61.54/50.65) and contract bond loss ratio means (0.83-0.58/0.74) between licensed and non-licensed groups were not greater than one-half of a standard deviation.

Hypothesis 8, "there was no difference between the licensed and nonlicensed contractor groups in level of harm to the general public as measured by liability insurance rates," was not rejected. The differences in general contractor premises and operations insurance premium rate index means (-0.15-0.13/0.96), general contractor completed operations insurance premium rate index means (0.19-(-0.18)/0.75), residential contractor premises and operations insurance premium rate index means (-0.13-0.12/0.86), and residential contractor completed operations insurance premium rate index means (0.03-(-0.03)/0.94) between the licensed and nonlicensed groups were not greater than one-half of a standard deviation.

The more stringent grouping of licensing with examination feature resulted in the rejection of some of the related null hypotheses. Hypothesis 3, "there was no difference between the licensed with competency exam and nonlicensed contractor groups as measured by the level of

employee injury incidence rates or worker compensation insurance rates," was rejected. Both the mean injury incidence rate and worker compensation insurance rate for the group licensing with the examination feature were more than one-half of a standard deviation higher than the rates for the nonlicensing group (16.25-14.75/2.31) (14.14-11.35/5.09), as shown in Table 4.4.

Hypothesis 5, "there was no difference between the licensed with competency examination and nonlicensed contractor groups as measured by the level of lien bond loss ratios," was not rejected. The difference in lien bond loss ratio means between the group licensed with competency examination feature and the nonlicensed contractor group was less than one-half of a standard deviation (-0.03-0.14/0.52).

Hypothesis 7, "there was no difference between the licensed with competency exam and nonlicensed contractor groups as measured by business failure rates or level of contract bond loss ratios," was rejected. The contract bond loss ratio mean for the group licensed with competency examination feature was more than one-half of a standard deviation greater than the contract bond loss ratio mean for the nonlicensed group (1.02-0.61/0.81). The group licensed with competency exam had the higher harm level.

Table 4.4

Harm Level Means--Licensing With Exam Since 1980 or Others

ALL OTHERS (Control Group)				
N Obs	Variable	N	Mean	Std. Dev.
39	II	27	14.75	2.31
	WC	32	11.35	5.09
	LN	39	0.14	0.52
	CB	39	0.61	0.81
	BF	39	58.44	43.69
	GC	33	0.07	0.77
	RC	33	0.08	0.90
	GP	34	0.10	0.90
	RP	34	0.08	0.94
	LB	39	0.09	0.49
	BB	39	1.14	3.65
	LD	39	2.47	0.64
	FR	39	139.51	132.38
	PI	23	0.01	0.10
	PN	38	0.01	0.22
	PC	39	0.11	1.33
LICENSING WITH EXAMINATION SINCE 1980				
N Obs	Variable	N	Mean	
11	II	11	16.25	
	WC	10	14.14	
	LN	11	-0.03	
	CB	11	1.02	
	BF	11	69.55	
	GC	10	-0.25	
	RC	10	-0.25	
	GP	10	-0.33	
	RP	10	-0.28	
	LB	11	0.12	
	BB	11	0.60	
	LD	11	2.34	
	FR	11	198.36	
	PI	11	-0.08	
	PN	11	-0.35	
	PC	11	-0.31	

Table 4.4--continued.

II=injury incidence, WC=worker compensation,
 LN=lien bond l.r., CB=contract bond l.r., BF=
 business failures, GC=completed operations
 insurance(gen.), RC=completed operations
 insurance(res.), GP=premises & operations
 insurance(gen.), RP=premises & operations
 insurance(res.), LB=license bond l.r., BB=bid
 bond l.r., LD=lawyer density, FR=fraud rate,
 PI=injury incidence performance, PN=lien bond
 l.r. performance, PC=contract bond l.r.
 performance.

Hypothesis 9, "there was no difference between the licensed with competency exam and nonlicensed contractor groups in level of harm to the general public as measured by liability insurance rates," was not rejected. The differences in general contractor premises and operations insurance premium rate index means (-0.33-0.10/0.90), general contractor completed operations insurance premium rate index means (-0.25-0.07/0.77), residential contractor premises and operations insurance premium rate index means (-0.28-0.08/0.94), and residential contractor completed operations insurance premium rate index means (-0.25-0.08/0.90) between the group licensed with competency examination feature and the nonlicensed group were less than one-half of a standard deviation.

Performance variable means for licensing with examination and nonlicensed groups were calculated and are shown in Table 4.4. The meaningful between-group differences in performance variables means are summarized in Table 4.5. The testing criterion for performance variables was either a difference of one-half of a standard deviation or a 25 percentage point difference.

Hypothesis 10, "from 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in employee injury incidence rate," was rejected. The percentage of change in injury incidence rate for the two groups from the 1980 level to the 1986 level were calculated and expressed in decimal form. The mean change for the without-examination group was 0.01 (1% increase). The mean change for the group with examination since 1980 was -0.08 (8% decrease). The difference between injury incidence rate change means was greater than one-half of a standard deviation $(-0.08 - 0.01/0.10)$. The group licensed with competency examination had the greater reduction in harm level.

Hypothesis 11, "from 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in lien bond loss ratio," was rejected. The difference between lien bond loss ratio change means was greater than one-half of a standard deviation $(-0.35 - 0.01/0.22)$. The group licensed with

Table 4.5

Meaningful Mean Differences--With Exam or Other

HARM MEASURES		
Variable	Other States Mean	Licensing With Exam Mean
II	14.75	16.25
WC		
LN		
CB	0.61	1.02
BF		
GC		
RC		
GP		
RP		
LB		
BB		
LD		
FR		
PERFORMANCE MEASURES		
Variable	Other States Mean	Licensing With Exam Mean
PI	0.01	-0.08
PN	0.01	-0.35
PC	0.11	-0.31 *

* over 25%

II=injury incidence, WC=worker compensation, LN=lien bond l.r., CB=contract bond l.r., BF=business failures, GC=completed operations insurance(gen.), RC=completed operations insurance(res.), GP=premises & operations insurance(gen.), RP=premises & operations insurance(res.), LB=license bond l.r., BB=bid bond l.r., LD=lawyer density, FR=fraud rate, PI=injury incidence performance, PN=lien bond l.r. performance, PC=contract bond l.r. performance.

competency examination had the greater reduction in harm level.

Hypothesis 12, "from 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in contract bond loss ratio," was rejected. The difference between mean contract bond loss ratio changes was .42, which was greater than 25 percentage points ($-0.31 - 0.11 > -25\%$). The standard deviation for contract bond loss ratio changes was quite large at 1.33. The group licensed with competency examination had the greater reduction in contract bond loss ratio.

Interpretation

The level of harm measures attached to the following contractor contact groups as previously indicated:

Employees	WC II
Employees (subcontractors)	LN
Clients	CB BF
Clients/Public	GC RC
Public (general)	GP RP

Of the three alternative reasons for licensing, business failures, lawyer density, and fraud rate, only the last showed any meaningful differences for any of the licensing features. Higher fraud rates (general) were found in states where the licensing agency had the power to revoke a contractor's license.

The results of testing Hypothesis 1 are shown in Table 4.3. The null hypothesis was rejected as there were numerous meaningful differences. Level of harm measures that were related to employees and clients were uniformly higher with the existence of some identified licensing agency feature. Level of harm measures related to the general public generally were lower with the existence of some identified licensing agency feature, possibly reflecting a quick reduction in harm levels to the general public, although no performance variable for this contact group was used in the research analysis.

In Hypotheses 2, 4, 6, and 8, harm level variables were tested over the straight licensing or not licensing variable L. The means of all variables were calculated and are shown in Table 4.2 in the rows L=0 and 1. The only meaningful variable was fraud rate. Since L was grouped only on whether a licensing law and process existed, state regulatory processes were considered as licensing regardless of how long they existed or whether they included an examination process. A more appropriate grouping was needed.

For Hypotheses 3, 5, 7, and 9, states were classified as licensing or nonlicensing based on a more stringent definition. Licensing states must have had an examination process prior to 1981. For Hypothesis 3, higher injury incidence rates and worker compensation rates were found,

and for Hypothesis 7, higher contract bond loss ratios were found for this licensing group. The more stringent definition brought out which harm measures were related to the regulatory effort.

With the more stringent licensing definition for licensing, Hypotheses 10, 11, and 12 were tested, and the results are shown in Table 4.5. The change in injury incidence rate and the change in lien bond loss ratio were both negative by more than one-half of a standard deviation, indicating meaningfully better performance in 1986 than in 1980. The change in contract bond loss ratio was over 25 percentage points better in 1986 than in 1980 and therefore meaningful. It was to be noted that the change in contract bond loss ratio was not greater than one-half of a standard deviation. The variance for change in contract bond loss ratio was large. One possible explanation of the large standard deviation for the contract bond loss ratio performance variable, PC, may have been its sensitivity to factors other than those that can be controlled through the regulatory process. A clue to these factors may have been the major factors given by Dun and Bradstreet for causes of construction business failures: bad profits (36%), incompetence (12%), loss of market (9%), and inadequate sales (8%) (Dun & Bradstreet, 1984).

Examinee Attributes

Statistical Analysis and Results

Applicants for the examination have been particularly interested in those attributes that could be changed or acquired. Those attributes on which applicants could have some measure of control were level of education, college degree, and years of experience. The analysis focused on these. In this phase, Hypotheses 13, 14 and 15, concerning relationships between college degree major, level of education, or years of experience, and examination success, were analyzed. As there were only five variables in this analysis, their definitions are presented below in the text.

Independent variables

CD, college degree major. The six categories for this variable were based on the college level responses provided as answers to question #1 on the exam questionnaire, with the exception of the category of Sanitary Engineer, which was combined with Other since there was only one examinee in this category. These categories were Building Construction, Architecture, Civil Engineering, Mechanical Engineering, Business Administration, and Other.

EL, level of education. From question #1 on the exam questionnaire the responses were grouped into the following categories: college degree, some college, and high school or less. This variable was needed because of frequency problems with the four SEL categories.

SEL, level of education. The four level categories for this variable were derived from the responses provided for

question #1 on the exam questionnaire. They were college degree, some college, high school diploma, and none of these.

YE, years of experience. Responses to question #7 on the exam questionnaire were combined into the following four categories: 1-6 years, 7-12 years, 13-18 years, and 19 or more years.

Dependent variables

O, outcome. Pass or fail.

Procedure

Step one of phase two analysis consisted of a frequency study of college degree, educational level, years of experience, and outcome variables. The frequency tables for this phase of the analysis are included in Appendix F. The test groups were the passing group and the failing group for the analysis of college degree, educational level and years of experience. The assumptions for the chi-square test were met. Once the relationship between variables was shown to be significant, comparing the passing group frequency tables with the all-examinee frequency tables would indicate the effects of the examination process in changing the make-up of the new licensee group and therefore, over time, the entire contractor licensing pool.

Step two of phase two was an analysis of only those examinees having a college degree. To test Hypothesis 13 first it was necessary to delete all non-college-degree

respondents from the sample. The college degree frequency data are summarized in Table 4.6.

Table 4.6

College Degree Frequency Data

College Degree	Passing	Failing
Architecture	12	29
Building Construction	50	40
Business Administration	60	49
Civil Engineering	40	20
Mechanical Engineering	8	10
Other college degree	81	64

Hypothesis 13, "there was no significant difference in proportional frequency of different college degree majors between failing group and passing group for the Florida Certified Contractor's Examination," was rejected. There is a relationship between the type of college degree and outcome. Examination of Table 4.7 reveals a chi-square of 14.97 for the test of college degree types against outcome, which is greater than the critical chi-square of 11.07 (5 df, $Q=.05$). Those with architecture or mechanical engineering degrees did worse than expected. Those with civil engineering degrees did much better than expected.

Table 4.7

Chi-Square Results for College Degree Relationship to Outcome

Row	Col.	Obs. Freq. (O)	Expected Frequency (E)	O-E	$\frac{(O-E)^2}{E}$	$\frac{(O-E)^2}{E}$
ARC	Pass	12	22.2	-10.2	104.6	4.71
BCN	Pass	50	48.8	1.2	1.5	0.03
BUS	Pass	60	59.1	0.9	0.8	0.01
CEG	Pass	40	32.5	7.5	55.8	1.72
MEG	Pass	8	9.8	-1.8	3.1	0.32
OTH	Pass	81	78.6	2.4	5.7	0.07
ARC	Fail	29	18.8	10.2	104.6	5.57
BCN	Fail	40	41.2	-1.2	1.5	0.04
BUS	Fail	49	49.9	-0.9	0.8	0.02
CEG	Fail	20	27.5	-7.5	55.8	2.03
MEG	Fail	10	8.2	1.8	3.1	0.38
OTH	Fail	64	66.4	-2.4	5.7	0.09
		463	463	0.0	Chi-sq.=	14.97
Critical chi-square w/(6-1)(2-1) df=11.07 at Q=.05.						

Scrutiny of the frequency table for college degree by outcome yielded an average passing rate of 54.21%. The rates in order of highest to lowest were Civil Engineering, 66.67%; Other, 55.86%; Building Construction, 55.56%; Business Administration, 55.05%; Mechanical Engineering, 44.44%; and Architecture, 29.27%. All of these rates except for Architecture were higher than the overall passing rate.

Phase two analysis continued with a test of level of education against outcome to determine if there was a

significant effect on competency testing. The frequency results for Hypothesis 14 are presented in Table 4.8.

Table 4.8

Level of Education Frequency Data

Level of Education	# Passing	# Failing
None of These	11	45
High school diploma	74	258
Some college	181	345
College degree	251	212

Hypothesis 14, "there was no significant difference in proportional frequency of different levels of education between failing group and passing group for the Florida Certified Contractor's Examination," was rejected. There is a relationship between level of education and outcome. The chi-square statistic for the test of levels of education against outcome was 97.66, which was greater than the critical chi-square of 7.81 (3 df, $Q=.05$). Those with college degrees as a group did better than expected. Those with less than a college education did worse than expected.

The frequencies of pass and fail scores within the four levels of education categories (SEL) show better passing rates with increasing levels of education. The average passing rate for nonrespondents to this question was 37.55%.

Table 4.9

Chi-Square Results for Levels of Education Relationship to Outcome

Row	Col.	Obs. Freq. (O)	Expected Frequency (E)	O-E	(O-E) ²	(O-E) ² ----- E
NoT	Pass	11	21.0	-10.0	100.5	4.78
HS	Pass	74	124.7	-50.7	2565.5	20.58
SC	Pass	181	197.5	-16.5	271.9	1.38
CD	Pass	251	173.8	77.2	5954.4	34.25
NoT	Fail	45	35.0	10.0	100.5	2.87
HS	Fail	258	207.3	50.7	2565.5	12.37
SC	Fail	345	328.5	16.5	271.9	0.83
CD	Fail	212	289.2	-77.2	5954.4	20.59
		1377	1377	0.0	Chi-sq.=	97.66
Critical chi-square w/(4-1) (2-1) df=7.81 at Q=.05.						

The category "None of these" was assumed to mean less than a high school level of educational achievement. Individuals in this category had the lowest passing rate, with only 19.64% passing. Individuals in the "high school diploma" category were below average, with a passing rate of only 22.29%. Those with "some college" were close to the average, with a passing rate of 34.41%. Persons with "college degree" had the highest passing rate, 54.21%.

The years of experience frequency data for the passing and failing groups are presented in Table 4.10.

Table 4.10

Years of Experience Frequency Data

The chi-square statistic for the test of years of experience against outcome is 35.02, which is greater than the critical chi-square of 7.81 (3 df, $Q=.05$). Those with less than seven years of experience did better than expected. Those with more than 12 years of experience did worse than expected.

The frequencies of pass and fail in the years of experience categories showed better passing rates for the lower levels of experience, decreasing with increasing experience. Examinees with 1-6 years of experience had a passing rate of 48.90% against the overall passing rate of 37.39%. Those with 7-12 years of experience had a passing rate of 37.07%, which approximated the overall passing rate. Examinees in the 13-18 years and over 19 years of experience categories had passing rates of 31.91 and 27.00%, respectively.

With the testing of Hypotheses 13, 14, and 15, the effect of the competency examination in changing the proportional makeup of the passing group in respect to type of college degree, educational level, and years of experience was proven significant. The final frequencies and chi-square tests were included in the analysis to indicate how years of experience and level of education had been affected in concert by the competency examination process.

Table 4.12

Education by Experience Frequency Data

	<u>Freq</u>
PASS GROUP	
High school or less with 1-6 years experience	17
High school or less with 7-12 years experience	33
High school or less with 13-18 years experience	18
High school or less with 19+ years experience	16
Some college with 1-6 years experience	45
Some college with 7-12 years experience	74
Some college with 13-18 years experience	38
Some college with 19+ years experience	23
College degree with 1-6 years experience	115
College degree with 7-12 years experience	76
College degree with 13-18 years experience	33
College degree with 19+ years experience	25

The frequency results for outcome = passing for four levels of education by the years of experience included less than five observations in three of the "none of these" cells, therefore violating one of the assumptions for the chi-square test. As a result, the level of education categories were changed, grouping "high school diploma" with "none of these" so that only three level of education groupings were used in further analyses. The frequencies for the three levels of education by experience level for the pass group are shown in Table 4.12.

The chi-square significance test results for testing the independence of level of education from years of experience indicate a strong relationship between the variables.

The chi-square significance test results for the passing group for the relationship between educational level and years of experience were similar and are shown in Table 4.13. For individuals who passed the exam there was a significant relationship between their experience and their level of education. Individuals without college degrees and with less than seven years of experience did worse than expected on the exam. Individuals without college degrees but with over six years of experience did better than expected. In the college degree group the experience relationship was reversed. College graduates with less than seven years of experience did better than expected and those with more than six years of experience did worse than expected. The final three tables in Appendix F show the distribution of years of experience and educational level characteristics for individuals who failed, for individuals who passed, and for all who responded to the questionnaire.

Interpretation

The passing group differed significantly from the failing group with respect to educational level and years of experience attributes. Through the process of competency examination the aspiring contractor group (examinees) was reduced to a passing group who are eligible to join the contractor pool. The passing group had proportionally more education and less experience than the failing group and therefore more education and less experience than the

Table 4.13

Chi-square Results for the Relationship Between Education and Experience

Row	Col.	PASS Obs. Freq. (O)	Expected Frequency (E)	O-E	$(O-E)^2$	$\frac{(O-E)^2}{E}$
HS-	1-6	17	29.0	-12.0	143.6	4.95
HS-	7-12	33	30.0	3.0	9.2	0.31
HS-	13-18	18	14.6	3.4	11.7	0.81
HS-	19+	16	10.5	5.5	30.5	2.91
SC	1-6	45	62.1	-17.1	292.6	4.71
SC	7-12	74	64.2	9.8	95.8	1.49
SC	13-18	38	31.2	6.8	45.9	1.47
SC	19+	23	22.5	0.5	0.3	0.01
CD	1-6	115	85.9	29.1	846.1	9.85
CD	7-12	76	88.8	-12.8	164.5	1.85
CD	13-18	33	43.2	-10.2	104.0	2.41
CD	19+	25	31.1	-6.1	36.8	1.18
SUM =		513	513	0.0	chi-sq.=	31.95
Critical chi-square w/(3-1)(4-1) df=12.59 at Q=.05.						

examinee group from which it derived. One explanation for these results is that the general broad array of tasks and knowledge areas needed successfully to operate as a prime contractor were represented on the examination, and higher educational levels gave examinees the broader, more generalized knowledge and skills appropriate to contracting. At the same time, more years of experience may have meant only more time in a narrower range of knowledge areas and skills.

CHAPTER V A MODEL FOR PROTECTING THE PUBLIC

Introduction

In their mission to protect the public from harm resulting from the acts of contractors, states often have chosen to regulate the construction industry through contractor licensing. A model is proposed to address the needs of states to rationally and methodically analyze specific problem areas, regulatory alternatives, and licensing options. The diagram shown in Figure 5.1 orders and summarizes the steps necessary for regulatory decision making.

Regulatory decision makers have sole discretion in two of the steps in the model: the weighting of the relative importance of harm to worker, client, and public; and the selection of actions from the short list deemed appropriate to the unique situation in their own states. In each of the other steps in the model there is an associated table or matrix element. The first element of the model is a table indicating the levels of harm and performance of these harm levels over time. Next, a matrix of actions to be taken has been developed to fit with the levels of harm and

performance ratings from the first data table. Once the harm data are used in the action matrix to determine what general actions are to be taken, a third element is necessary: lists of options to be considered. The lists are the worker protection options, client protection options, public protection options, and additional options. The final element is a list of licensing features already in effect in the state.

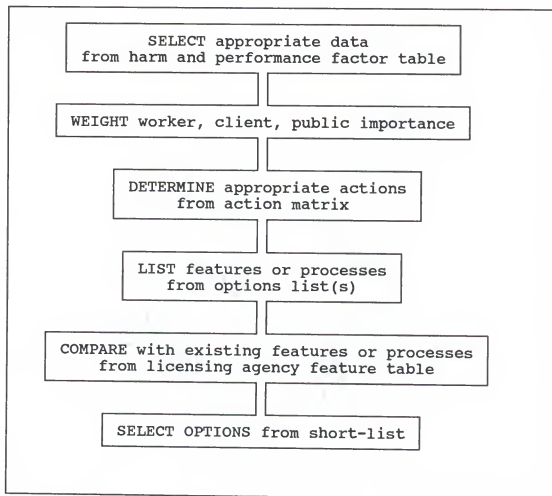


Figure 5.1. Model Diagram.

Developing the Model

Harm and Performance Ratings Table

States were sorted and ranked according to injury incidence rate, performance of injury incidence, contract bond loss ratio, performance of contract bond loss ratio, and average premises and operations insurance rate. The tables showing these rankings can be found in Appendix G. The two lien-related variables, lien bond loss ratio and performance of lien bond loss ratio, were not used in this model for two reasons. First, the injury incidence rate data were more directly related to workers; and, second, the data for lien bond loss ratio contained many zero values, limiting its ability to show differences among states. Cutoff points were established to divide available data for the selected variables into three approximately equal groupings. These grouped values were then used to categorize states into three harm levels: high, middle, and low. The harm to workers level was derived from the injury incidence rate. The harm to clients level was derived from the contract bond loss ratio variable. The harm to public level was derived from an average of general contractor and residential contractor premises and operations liability insurance rate z-scores. No performance variable existed for harm to the public.

Performance ratings were determined by cut-off points dividing the number of states with data values into three

approximately equal groups. The harm to workers performance was created from the injury incidence performance variable. Values given performance ratings were "poor" for the bottom one-third, "average" for the middle one-third, and "good" for the top one-third of the states. The harm to client performance was derived in a like manner from the contract bond loss ratio performance variable.

The data for harm and performance factors are shown in Table 5.1. Missing values do not detract from the model. Values are missing only because data from other states comparable to that collected were not available. For any state with missing data, other harm-level or performance-level data specific to that state could be obtained, and the use of the model in that state's decision making would not be hindered.

Action Matrix

The action matrix (see Table 5.2) is applicable to each of the three public groups with which the contractor has interaction: the workers, the clients, and the general public. The harm factors associated with each group are harm to worker level, derived from injury incidence rate; harm to client level, derived from the contract bond loss ratio; and harm to the public level, derived from premises and operations liability insurance rate. The first two groups have a performance level factor. Down the left side

Table 5.1

Harm and Performance Ratings

ST	HWL	HWP	HCL	HCP	HPL
AK	H	avg	L	poor	L
AL	M	poor	H	good	H
AR	L	good	M	avg	M
AZ	H	avg	H	poor	M
CA	H	avg	M	good	.
CO	.	.	H	poor	H
CT	H	poor	L	good	H
DE	L	good	M	avg	M
FL	H	good	M	good	M
GA	.	.	M	avg	M
HI	H	good	H	poor	L
IA	M	avg	L	avg	M
ID	.	.	M	avg	H
IL	.	.	H	poor	.
IN	L	avg	M	good	H
KS	L	poor	H	poor	L
KY	L	avg	M	avg	.
LA	M	good	H	good	M
MA	L	.	H	poor	.
MD	M	poor	L	good	H
ME	H	poor	L	good	M
MI	L	poor	H	avg	H
MN	M	good	L	good	H
MO	M	poor	M	avg	H
MS	L	.	H	poor	L
MT	H	avg	L	avg	H
NC	L	poor	H	poor	L
ND	.	.	L	good	L
NE	M	good	H	poor	L
NH	.	.	L	avg	M
NJ	.	.	L	good	.
NM	M	good	H	poor	L
NV	H	good	M	good	H
NY	.	.	L	good	H
OH	.	.	H	poor	H
OK	L	.	M	poor	L
OR	H	avg	M	avg	M
PA	M	.	M	avg	H
RI	L	avg	H	poor	L
SC	L	good	M	avg	L
SD	.	.	M	avg	M
TN	M	good	H	poor	L

Table 5.1--Continued.

TX	.	.	H	poor	L
UT	H	avg	M	poor	M
VA	M	avg	L	good	L
VT	H	poor	L	good	M
WA	H	poor	L	good	H
WI	.	.	L	avg	M
WV	L	good	L	good	L
WY	M	poor	M	avg	.

ST=state, HWL=harm to worker level, HWP=harm to worker performance, HCL=harm to client level, HCP=harm to client performance, HPL=harm to public level
Ratings: H=high, M=middle, L=low

of the matrix are the three level of harm factors, while across the top are the three level of performance factors. Within the matrix cells are the general actions that are appropriate for regulation in the harm level and performance level indicated. The actions are the logical response to the indicated level and performance ratings.

Table 5.2

Action Matrix

	LEVEL OF HARM	PERFORMANCE		
		poor	average	good
	H	Implement new features and/or programs from options list(s)	Implement new features and/or programs from options list(s)	Maintain current programs. Look for new features and/or programs for possible implementation.
	M	Implement new features and/or programs from options list(s)	Monitor levels. Develop plan to implement new features and/or programs.	Maintain current programs.
	L	Monitor levels and performance. Make current programs more effective.	Drop marginal programs. Cut regulatory costs.	Drop programs, requirements, & procedures not cost effective.

Options ListsProcedure

In the regression analysis used to test Hypothesis 16, only the licensing states were considered. Hypothesis 16, "the licensing agency features, competency examination, task analysis base for examination, disciplinary process, power to revoke, liability insurance, license bond, and public information availability were equally effective in reducing levels of harm to the public," was rejected. Since data

from all the licensing states were available, significance testing was inappropriate. Regression analysis, however, was performed on the variables injury incidence rate performance and contract bond loss ratio performance, not for testing significance of the model, but for determining which licensing agency features had noticeable effects on the performance variables. Coefficients for the independent variables (examination [disciplinary process], years of experience requirement, insurance requirement, task analysis base, and power to revoke) for testing feature effects on injury incidence performance are shown in Table 5.3.

Table 5.3

Effect of Feature on Harm to Workers

REGRESSION OF E,D,Y,I,T,R ON PI		
Variable	DF	Parameter Estimate
INTERCEP	1	0.129250
E and D	1	-0.079000 *
Y	1	-0.192000
I	1	-0.044500
T	1	0.147750
R	1	-0.108000

* E and D were present together in the same states.

The regression equation for the data is

$$PI_{\text{est}} = 0.129 + (-0.079)(E) + (-0.192)(Y) + (-0.045)(I) + (0.148)(T) + (-0.108)(R)$$

The desired result for the performance of injury incidence rate (PI) is to be a negative number. A negative injury incidence rate of performance represents a decrease in injury incidence rate between 1980 and 1986 of the percent indicated. Negative coefficients for the independent variables indicate the effectiveness of the existence of that feature in reducing injury incidence rates.

Coefficients for the independent variables (examination [disciplinary process], years of experience requirement, license bond requirement, task analysis base, power to revoke, and public information access) for testing feature effects on contract bond loss ratio performance are shown in Table 5.4.

Table 5.4

Effect of Features on Harm to Clients

REGRESSION OF E,Y,B,T,R,P ON PC		
Variable	DF	Parameter Estimate
INTERCEP	1	-1.240699
E and D	1	0.149064 *
Y	1	-1.308833
B	1	0.397890
T	1	2.275611
R	1	0.143508
P	1	-0.210818

* E and D were present together in the same states.

The regression equation for the data is

$$PC_{est} = -1.241 + (0.149)(E) + (-1.309)(Y) + \\ (0.398)(B) + (2.276)(T) + (0.144)(R) + \\ (-0.211)(P)$$

The desired result for the performance of contract bond loss ratio (PC) is to be a negative number. A negative PC represents a decrease in contract bond loss ratio between 1980 and 1986 of the percent indicated. Negative coefficients for the independent variables indicate the effectiveness of the existence of that feature in reducing contract bond loss ratios.

Many features suggested by the research were not in use by most of the licensing states and therefore could not be part of this analysis. For the model, these were simply listed from the research when no rank could be determined.

Licensing features to protect the worker

Worker protection options were collected from the literature and are shown below in Table 5.5. The regression analysis of Hypothesis 16 indicates that minimum years of experience requirement (Y), revocation feature in disciplinary process (R), competency examination (E), and insurance requirement (I) are related to relative improvement in performance for the variable PI, reduction in injury incidence rate since the parameter estimates for these independent variables were negative. The variables in

the previous sentence are listed in rank order. This order is indicated in parentheses to the right of the option.

Table 5.5

Worker Protection Options

1. Field citation system
2. Recovery fund
3. Financial responsibility requirement
4. Competency examination (#3)
5. Minimum experience requirement (#1)
6. License bond requirement
7. Disciplinary process with power to revoke (#2)
8. Employer liability insurance requirement (#4)

Licensing features to protect the client

Client protection options were collected from the literature and are shown below in Table 5.6. The regression analysis of Hypothesis 16 indicates that minimum years of experience requirement (Y), and public information availability (P) are related to improvement in performance for the variable PC, reduction in contract bond loss ratio, since the parameter estimates for these independent variables were negative. The rank order is indicated in parentheses to the right of the option.

Licensing features to protect the public

Public protection options were collected from the literature and are listed in Table 5.7. The research had no

performance variable for harm to the public as has been explained previously. Therefore, no rank ordering was possible.

Table 5.6

Client Protection Options

1. Consumer education program
2. Full disclosure and public information access (#2)
3. Field citation system
4. Disciplinary process (fine, suspend, revoke)
5. Completed operations insurance requirement
6. Complaint investigation process
7. Mediation process
8. Recovery fund
9. Third party warranty
10. Financial responsibility requirement
11. Competency examination
12. Minimum experience requirement (#1)
13. License bond requirement
14. Premises and operations liability insurance requirement

Table 5.7

Public Protection Options

1. Field citation system
2. Completed operations insurance requirement
3. Third party warranty
4. Competency examination
5. Minimum experience requirement
6. Premises and operations liability insurance requirement

Additional licensing and nonlicensing options

These additional options listed in Table 5.8 were indicated in the literature. All but the last two on the list concern major changes in overall scope of licensing, jurisdiction of board, changes in regulatory processes not within the realm of the licensing agency, or making existing processes more effective and/or efficient. The final two options are new processes or requirements that may not be considered workable within the confines of the law or may not be deemed appropriate to the construction industry by licensing agencies.

Illustrating the Model

Single State Contractor Licensing Examples

The following two examples are presented to illustrate how the contractor licensing model works.

Utah (HWI=H HWP=avg HCL=M HCP=poor HPL=M)

Using Table 5.2, the action matrix for the worker harm and performance ratings above indicates "implement new features and/or programs from options list (worker)." The options are (a) field citation system, (b) recovery fund, (c) financial responsibility requirement, (d) competency examination, (e) minimum experience requirement, and (f) license bond requirement. As shown in Appendix C, Utah had licensing, examination, disciplinary system, a minimum years of experience requirement, a task analysis base for

Table 5.8

Additional Protection Options

1. Require more licenses per business:
 - a) license per number of supervisory or mid-level management (superintendent and/or above)
 - b) license per job over some threshold dollar contract amount or building size.
2. Require license for superintendents for jobs over a certain threshold contract amount or building size.
3. Eliminate 'grandfathered' status by requiring that these contractors meet all requirements within a specified time.
4. Authorize agencies/boards to levy civil penalties.
5. Give agency judicial powers over unlicensed activity.
6. Eliminate 'reciprocal permitting' agreements between county licensing jurisdictions.
7. Require that building officials, including plan review and field inspection officers, be certified through competency examination.
8. Interact with other state regulatory institutions such as the trade commission, court systems, sales tax department, or attorney general's office, to get better handling of contractor licensing matters.
9. Closely define terms such as "workmanship" (workmanship standards); "good moral character" (guilty of certain felonies); "financially responsible" (minimum net worth, good credit history, no unpaid creditors from prior bankruptcy).
10. Deregulate portions of industry not causing harm to public (complaints etc.) so that agency can concentrate on problem sectors.
11. Set a minimum level or type of education requirement.
12. Establish an evaluation and recertification process.

the examination, and some public information available. The regulatory suggestions for Utah to reduce harm to the workers would be to select one or more of the following; license bond requirement, a recovery fund, and/or a field citation system. Utah also should consider taking those actions that address harm to workers from the additional options list.

Using Table 5.2, the action matrix, with the client harm and performance ratings for Utah, indicates "implement new features and/or programs from options list (client)." The options are (a) consumer education program, (b) full disclosure and public information access, (c) field citation system, (d) disciplinary process, fine, suspend, revoke, (e) completed operations insurance requirement, (f) complaint investigation process, (g) mediation process, (h) recovery fund, (i) third party warranty, (j) financial responsibility requirement, (k) competency examination, (l) minimum experience requirement, (m) license bond requirement, and (n) premises and operations liability insurance requirement. As Utah had licensing, examination, disciplinary system, a minimum years of experience requirement, a task analysis base for the examination, and some public information available already, the options recommended were to expand the public information available to become a consumer education program, to institute a field citation system, to have the power to revoke licenses, to include in the

complaint system a mediation process, to require completed operations and premises and operations insurance, and to require a license bond.

The level of harm to the public is represented by M. Since no harm to public performance data were generated through this research, that column in the action matrix cannot be determined. Utah performance in harm to the public could be determined from within-state data and the appropriate column selected. Since a high level of harm was not indicated, the search for independent harm to public performance variables would have little importance. As was indicated in the model diagram, Figure 5.1, Utah regulators must have weighted the relative importance of protecting the worker, client, and public from the acts of contractors. Utah regulators could use the short list determined from the model for the selection of actions for the regulation of contractors in their state.

Rhode Island (HWL=L HWP=avg HCL=H HCP=poor HPI=L)

Using Table 5.2, the action matrix, with the worker harm and performance ratings above, indicates "drop marginal programs. Cut regulatory costs." As Rhode Island did not license contractors in any way, this advice was moot.

Using Table 5.2 for the client harm and performance ratings, the action matrix gave the directions to "implement new features and/or programs from options list." The client harm options list had the following items: (a) consumer

education program, (b) full disclosure and public information access, (c) field citation system, (d) disciplinary process (fine, suspend, revoke), (e) completed operations insurance requirement, (f) complaint investigation process, (g) mediation process, (h) recovery fund, (i) third party warranty, (j) financial responsibility requirement, (k) competency examination, (l) minimum experience requirement, (m) license bond requirement, and (n) premises and operations liability insurance requirement. Any or all of these suggestions were appropriate for Rhode Island regulation of the construction to reduce the client harm level.

The harm to general public rating was L, indicating a low level of harm; therefore, no suggestions for further analyses were made. A weighting of harm to worker, client, and public groups was left to the Rhode Island regulators who must then decide which (and if any in this case) actions to take.

All-States Analysis

All 50 states except those without injury incidence rate data were categorized by level of harm and performance for injury incidence rate, and the results are shown in Table 5.9. States that have been licensing contractors with a competency examination process since 1980 are marked with an asterisk. Six of these 11 licensing states showed good performance, three showed average performance, and only two

licensing states showed poor performance. These last two, Michigan and North Carolina, had low injury incidence rates. Tables showing the ranking of states by injury incidence rate, performance of the injury incidence rate, contract bond loss ratio, performance of the contract bond loss ratio, and average liability insurance premium index are included in Appendix G.

Table 5.9

Protection of the Worker: All States

	LEVEL OF HARM	PERFORMANCE		
		poor	average	good
H		Connecticut Maine Vermont Washington	Alaska * Arizona * California Montana Oregon * Utah	* Florida * Hawaii Kansas * Nevada
M		Alabama Maryland Missouri Wyoming	Iowa Virginia	* Louisiana Minnesota Nebraska * New Mexico Tennessee
L		* Michigan * N. Carolina	Indiana Kentucky Rhode Island	Arkansas Delaware * S. Carolina West Virginia
* States that have licensed with competency exam since 1980				

All 50 states were categorized by level of harm and performance for contract bond loss ratio, and the results are shown in Table 5.10. Five of these 11 licensing states showed poor performance, two showed average performance, and four licensing states showed good performance. None of the licensing states had a low contract bond loss ratio. The groupings of the states in the three diagonal categories from upper left to lower right indicate a divergence of states with respect to contract bond loss ratio. The high level of harm states had poor performance and the low level of harm states had good performance.

All 50 states were categorized by level of harm for average liability insurance premium index, and the results shown in Table 5.11. States without liability insurance data were omitted. This table is unlike the previous two in that there was no performance variable with which to categorize. States that have been licensing contractors with a competency examination process since prior to 1980 are marked with an asterisk. Four out of 10 licensing states had low insurance premium levels. Another four licensing states had middle insurance premium levels. Only two had high insurance premium levels.

Table 5.10

Protection of the Client: All States

	LEVEL OF HARM	PERFORMANCE		
		poor	average	good
H		* Arizona Colorado * Hawaii Illinois Kansas Massachusetts Mississippi * N. Carolina Nebraska * New Mexico Ohio Rhode Island Tennessee Texas	* Michigan	Alabama * Louisiana
		Oklahoma * Utah	Arkansas Delaware Georgia Idaho Kentucky Missouri Oregon Pennsylvania * S. Carolina South Dakota Wyoming	* California * Florida Indiana * Nevada
M				
L		Alaska	Iowa Montana N. Hampshire Wisconsin	Connecticut Maryland Maine Minnesota North Dakota New Jersey New York Virginia Vermont Washington West Virginia
* States that have licensed with competency exam since 1980				

Table 5.11

Protection of the Public: All States

LEVEL OF HARM			
no performance levels available			
H	Alabama	Colorado	Connecticut
	Idaho	Indiana	Maryland
	* Michigan	Minnesota	Missouri
M	Montana	* Nevada	New York
	Ohio	Pennsylvania	Washington
	Arkansas	* Arizona	Delaware
L	* Florida	Georgia	Iowa
	* Louisiana	Maine	N. Hampshire
	Oregon	South Dakota	* Utah
L	Vermont	Wisconsin	
	Alaska	* Hawaii	Kansas
	Mississippi	* N. Carolina	Nebraska
L	* New Mexico	Oklahoma	Rhode Island
	* S. Carolina	Tennessee	Texas
	Virginia	West Virginia	
* States that have licensed with competency exam since 1980			

Ten states had high levels of harm in two of the three categories of contractor publics. Six of those ten states had a poor performance rating in one of the two categories. Connecticut and Washington had high harm levels in the worker and general public categories, with poor performance in the worker category. Colorado and Ohio had high levels of harm in the client and general public categories, with poor performance in the client category. Arizona and Hawaii had high harm levels in the worker and client categories,

and a poor performance in the client category. The other four states with high levels of harm in two of the three categories were Nevada and Montana with high levels of harm in worker and general public categories, and Michigan and Alabama with high levels of harm in client and general public categories. Of these same ten states, Arizona, Hawaii, Michigan, and Nevada have been licensing contractors with a competency examination process since prior to 1980. The model indicates that they should consider further options to regulate the construction industry. The remaining six states should also consider implementation of licensing with a competency examination process and/or other licensing options. The remaining states with both a high level of harm and poor performance in only one contractor public category were Maine and Vermont in the worker category, and Illinois, Kansas, Massachusetts, Mississippi, Nebraska, Rhode Island, Tennessee, Texas, North Carolina and New Mexico in the client category. Only the last of these states have been licensing contractors with a competency examination process since prior to 1980. Regulators in these states should examine their objectives in protecting of the public from harm and consider regulatory options listed in the model.

West Virginia ranked best of all states. West Virginia had low harm levels in all categories, with good performance in the only two categories for which performance measures

were available. West Virginia did not have a state contractor licensing process. Five more states had low harm levels in two contractor public categories. Virginia had low harm levels in the client and general public categories, with good performance in the client category. Alaska had low harm levels in the client and general public categories, with poor performance in the client category. South Carolina had low harm levels in the worker and general public category, with good performance in the worker category. Rhode Island had low harm levels in the worker and general public categories, with average performance in the worker category. North Carolina had low harm levels in the worker and general public categories, with poor performance in the worker category. Only two of these six states have been licensing with a competency examination process since prior to 1980--North Carolina and South Carolina. Virginia has been licensing with a competency examination process since 1985. A licensing law was enacted in Alaska in 1968, but no examination nor disciplinary process has been implemented. Rhode Island, like West Virginia, has no state contractor licensing process.

Summary and Conclusions

In Chapter V, the researcher presented a model for protecting the public through contractor licensing. The steps involved were diagrammed and the elements which could be developed from the research and analysis were identified.

The elements of the model were the harm and performance ratings, the action matrix, the options lists, and the existing features data from the licensing agency data table in Appendix C. Two steps in the model did not involve these elements. These two steps involved state policy decisions and were left for input from the appropriate regulatory officials in the regulatory decision-making process. The first of these two steps was weighting the relative importance of worker harm, client harm, and harm to the general public. The second was the final selection of options from the short list of options appropriate for protecting the public from harm.

The harm and performance ratings indicated levels of harm in all three categories of contractor publics and performance in these measures of harm for the worker and client categories. The action matrix indicated actions to take for each combination of level of harm and performance rating. Four options lists were developed. The lists for worker protection, client protection, and public protection contained licensing features found in the literature. Regression analysis was performed on typical licensing features already in use. Those features having an effect on performance were ranked within the three options lists mentioned previously. The final list includes options regarding scope of licensing, board jurisdiction,

alternative regulatory processes, and improvements in efficiency.

Two ways to use the model were illustrated in the last part of the chapter. From an individual state perspective, the model was used to determine licensing agency features (options) appropriate to protecting the public (worker, client, or general public) from harm. In an all-states contractor licensing analysis, the model was used to classify states into two extremes of harm level and performance categories to show which states apparently need contractor licensing and to examine the distribution of licensing.

The model has been developed from research into licensing features and performance of licensing agencies as measured by variables indirectly related to harm to the public. The introduction of new licensing entry requirements, such as the competency examination process or special experience requirements, would not have an immediate impact on the pool of practicing contractors. Their effects would not be felt until some passage of time. The results from testing Hypothesis 16 indicated that, even though the examination process would not have yet screened all members of the pool of practicing contractors, it was as effective as the disciplinary processes, even those with revocation power, in reducing harm to the public. That disciplinary processes were susceptible to ineffectiveness resulting from

lack of funds and/or staff was repeatedly brought out in the research. A competency examination based on task analysis would be the preferred licensing agency feature to bring about the long-term reduction of harm to the public. Another screening feature, minimum years of experience, was shown to be effective in reducing harm to the public as well. License bond, contractor liability insurance, completed operations insurance, and third-party warrantee requirements for practicing contractors would provide compensation for harm to the public that has already occurred. As these risk transference instruments themselves are regulated and are subject to market competition, the cost effectiveness would be acceptable. Consumer education and public information accessibility was shown to be effective in reducing harm to clients. Keeping complete and accurate information on licensees and educating the public about contracting and the licensing process would provide the consumer with the information needed to make rational decisions in a competitive market environment.

CHAPTER VI
SUMMARY, RECOMMENDATIONS, AND IMPLICATIONS

Summary

Government has partially fulfilled its obligation in protecting the public from harm through licensing contractors. Eleven states have licensed contractors with a competency examination process established prior to 1980. Through analysis of measures of harm to the public, it has been shown that mean worker and client harm levels in those licensing states have been reduced. Another thirteen states have licensing statutes for prime contractors. The regulatory impact of these licensing structures varies. The remaining twenty-six states do not have prime contractor licensing statutes. As was shown, many of the non-licensing states have a problem with harm to the public as measured by the variables.

Much time and effort has been lost while some states addressed the same issues addressed previously by other states. Recently, sunrise procedures have brought some order to the creation of professional licensing for groups seeking licensing, but governmental bodies still need a model to aid in the structuring or restructuring of

contractor licensing processes. It was the purpose of this research to test whether the obligation of government to protect the public from harm resulting from the actions of prime contractors was met by the regulation of contractors through competency examination licensing processes. The results of testing the 16 hypotheses are presented in the following paragraphs. A further purpose of the research was to develop a licensing model focusing on the protection of the public. The model developed to guide regulation in protecting the public was discussed in Chapter V.

Hypothesis 1, "there was no relationship between state contractor licensing agency features and levels of harm," was rejected. Injury incidence rates, worker compensation rates, contract bond loss ratios, bid bond loss ratio, fraud rate, and general contractor completed operations insurance variables were higher in one or more groups with the licensing agency feature. Residential contractor completed operations insurance, general contractor premises and operations insurance, and residential contractor premises and operations insurance variables were lower in one or more groups with the licensing agency feature.

Hypothesis 2, "there was no difference between the licensed and nonlicensed contractor groups as measured by the level of employee injury incidence rates or worker compensation insurance rates," was not rejected. The differences were less than one-half of a standard deviation.

The differences between the licensed and nonlicensed contractor groups in levels of injury incidence rates and worker compensation insurance rates were not large enough to be meaningful.

Hypothesis 3, "there was no difference between the licensed with competency exam and nonlicensed contractor groups as measured by the level of employee injury incidence rates or worker compensation insurance rates," was rejected. Both the injury incidence rate and worker compensation insurance rate means were higher for the competency exam group.

Hypothesis 4, "there was no difference between the licensed and nonlicensed contractor groups as measured by the level of lien bond loss ratios," was not rejected. The differences were less than one-half of a standard deviation. The difference between the licensed and nonlicensed contractor groups in level of lien bond loss ratios was not large enough to be meaningful.

Hypothesis 5, "there was no difference between the licensed with competency exam and nonlicensed contractor groups as measured by the level of lien bond loss ratios," was not rejected. The difference was less than one-half of a standard deviation. The difference between the licensed with competency exam and nonlicensed contractor groups in levels of lien bond loss ratio was not large enough to be meaningful.

Hypothesis 6, "there was no difference between the licensed and nonlicensed contractor groups as measured by business failure rates or level of contract bond loss ratios," was not rejected. The differences were less than one-half of a standard deviation. The differences between the licensed and nonlicensed contractor groups in levels of business failure rates and contract bond loss ratios were not large enough to be meaningful.

Hypothesis 7, "there was no difference between the licensed with competency exam and nonlicensed contractor groups as measured by business failure rates or level of contract bond loss ratios," was rejected. The contract bond loss ratio mean was higher for the competency exam group.

Hypothesis 8, "there was no difference between the licensed and nonlicensed contractor groups in level of harm to the general public as measured by liability insurance rates," was not rejected. The differences were less than one-half of a standard deviation. The differences between the licensed and nonlicensed contractor groups in levels of residential and general contractor premises and operations and completed operations insurance rates were not large enough to be meaningful.

Hypothesis 9, "there was no difference between the licensed with competency exam and nonlicensed contractor groups in level of harm to the general public as measured by liability insurance rates," was not rejected. The

differences were less than one-half of a standard deviation. The differences between the licensed with competency and nonlicensed contractor groups in levels of residential and general contractor premises and operations and completed operations insurance rates were not large enough to be meaningful.

Hypothesis 10, "from 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in employee injury incidence rate," was rejected. The competency exam group performed better than the nonlicensed group by more than one-half of the control group standard deviation.

Hypothesis 11, "from 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in lien bond loss ratio," was rejected. The competency exam group performed better than the nonlicensed group by more than one-half of the control group standard deviation.

Hypothesis 12, "from 1980 to 1986 there has been no difference between licensed with competency exam and nonlicensed contractor groups in changes in contract bond loss ratio," was rejected. The competency exam group performed better than the nonlicensed group by more than 25 percentage points.

Hypothesis 13, "there was no significant difference in proportional frequency of different college degree majors

between failing group and passing group for the Florida Certified Contractor's Examination," was rejected. There was a relationship between type of degree and outcome.

Hypothesis 14, "there was no significant difference in proportional frequency of different levels of education between failing group and passing group for the Florida Certified Contractor's Examination," was rejected. Higher levels of education had higher passing proportions than expected.

Hypothesis 15, "there was no difference in proportional frequency of different levels of years of experience between failing group and passing group for the Florida Certified Contractor's Examination," was rejected. Fewer years of experience had higher passing proportions than expected.

Hypothesis 16, "the licensing agency features, competency examination, task analysis base for examination, disciplinary process, power to revoke, liability insurance, license bond, and public information availability were equally effective in reducing levels of harm to the public," was rejected. The regression procedure produced unequal coefficients for the feature variables.

Recommendations

Regulation of the Construction Industry

Licensing is a static response to a dynamic process. Periodic monitoring of harm levels and performance of the

licensing process is necessary to guide decision makers in the modification of the regulatory structure and process.

Recommendation No. 1: The Council of State Governments should distribute the model developed in this research to construction industry licensing boards and/or state government agencies for professional regulation throughout the 50 United States, recommend sunset reviews for states with contractor licensing processes, and recommend construction industry performance monitoring for a set period of time prior to enacting regulatory legislation as part of a sunrise process.

Consumers of construction may be construction experts themselves, or they may be completely ignorant of construction methods and terms. The part of the construction industry that interacts with the unsophisticated consumer is the remodeling and home building sector. The remodeling and home building sector of the industry is largely localized in nature, with little public information available concerning the past projects, reliability, financial capability, and honesty of specific contractors. The regression equation developed in the analysis of Hypothesis 16 indicated that the public information index was second only to minimum years of experience requirement in its effect in reducing harm to clients.

Recommendation No. 2: A process of record keeping and public disclosure of information on licensed contractors' construction history, financial ability, complaint and disciplinary record, and types of services offered should be implemented by all state licensing agencies.

A minimum years of experience requirement was shown as the most effective feature in reducing harm to both clients and workers in the regression equations developed in the analysis of Hypothesis 16. The minimum ranged from one to five years for different states.

Recommendation No. 3: State contractor licensing should include a minimum years of experience requirement.

Grouping states for analysis by whether they had competency examination established prior to 1980 was more appropriate than grouping by existence of a licensing law. The testing of three of four harm level hypotheses using the competency examination grouping showed meaningful results. None of the harm level null hypotheses using the licensing law grouping were rejected.

Recommendation No. 4: For comparative analysis states should be grouped by whether they had competency examination established and in effect for a period of time.

Using a competency examination grouping, Hypotheses 10, 11, and 12 were tested to determine whether licensing contractors with a competency examination worked to reduce levels of harm to the worker, the client, and the general public. Results for all three tests indicated meaningful reductions in harm levels as a result of licensing with a competency examination.

Recommendation No. 5: State policy makers wishing to reduce levels of harm to workers, clients, and the general public resulting from the actions of

contractors should institute state contractor licensing with a competency examination process.

Further Research

Statistics on the performance of licensing agencies per se was non-existent. Indirect measures that were consistent for all 50 states were difficult to find. No performance studies similar to this one were found in the literature.

Recommendation No. 6: The Council of State Governments and contractor associations such as the National Association of Home Builders, Associated General Contractors, and Associated Builders and Contractors should establish a statistical unit to gather appropriate harm reduction performance data.

Most disciplinary action resulted from complaints by clients. Complaint and disciplinary processes within contractor licensing agencies have been established to address the harm done to the client group by contractors. States have addressed harm to the worker through worker compensation statutes and civil court systems; and therefore, protecting the worker from harm was found to be of secondary importance in the contractor licensing process. Protecting the general public from harm resulting from actions of prime contractors is essentially a matter of assuring the construction of structurally sound and safe buildings and has been accomplished through implementation of building codes and inspection processes.

Recommendation No. 7: Research needs to be done in the area of harm to the client, particularly in regard to what specific harm is done to the client, what factors cause the harm, and which

factors are controllable and which are not controllable by regulatory bodies.

There are many different licensing features designed to redress harm already done to the public. Insurance requirements and bond requirements are two forms of risk transference found in the research, whereby third parties are paid premiums to assume the risk. Recovery funds have been suggested in several sunset reviews.

Recommendation No. 8: Research should be done into the cost effectiveness of the recovery fund as supplement or alternative to insurance and bond requirements.

Implications

Many regulatory suggestions not a part of the hypotheses testing and analysis were identified in the literature. Since they are not inconsistent with the results of the research and address the protection of the public from harm through the licensing of contractors they are included in this sections as implications from the research.

Protecting the public from harm is not the same as reducing the number of complaints received by the licensing agency. Sunset reviews tended to focus on how best to reduce complaints, speed up the disciplinary process, and use funds more efficiently. These review processes must focus on the performance of the agency in protecting the public against actual harm. Sunset review committees must

evaluate agencies on the basis of objective criteria over time.

Implication No. 1: Sunset review criteria for state review committees should include objective measures of protection of the public from harm. These measures must quantify the harm suffered by worker, client, and public groups over time.

Unlicensed activity is the major problem for contractor licensing agencies across the country. A disproportionate number of complaints involve unlicensed activity. Often the contractor licensing board has no control over the problem.

Implication No. 2: State legislatures should modify licensing statutes, giving their respective contractor licensing agencies civil authority over unlicensed practice, allowing triple damages, and excluding protection for the unlicensed contractor under the mechanics' lien law.

Mandatory continuing education has been suggested as one of the main features of recertification programs for professionals. The value of mandatory continuing education as implemented for professional recertification has been questioned. Construction is a multi-faceted industry making specific comprehensive requirements difficult to identify.

Implication No. 3: Legislatures and regulatory boards should make the specific decisions as to what a continuing education program should consist of, who should define it, provide it, and implement it, and how to evaluate the program's performance prior to considering a mandatory continuing education requirement for recertification of contractors.

Regulatory agencies are often understaffed and underfunded for the demands placed on them. Disciplinary

processes are often ineffective. Preventive measures are superior to reactive ones in preventing harm.

Implication No. 4: Regulatory features affecting admission to the practicing contractor pool should be emphasized over the disciplinary ones in regulation of the construction industry. These are the features and processes that affect who is allowed to practice. Effective admissions requirements such as minimum experience, passing a competency examination, and proving financial capacity should be of primary concern in the regulatory process.

The act of licensing prime contractors infers that licensed practitioners have met qualifications and standards necessary for the protection of the public. Even in the eleven states that have been licensing with a competency examination process established prior to 1980, there is no consensus as to the content of the examination.

Implication No. 5: Contractor licensing agencies using a competency examination process should conduct a joint effort to develop a comprehensive list of tasks and knowledge necessary for prime contracting. Each state licensing agency should then use this list as a basis for developing and selecting examination items meeting that state's individual examination purposes.

The literature has strongly suggested that some of the requirements or processes currently in effect are ineffective or unenforceable.

Implication No. 6: Legislatures should eliminate requirements for state residency, minimum age (not corresponding with legal age), and moral character from their statutes.

APPENDIX A

PART II: BUSINESS AND FINANCIAL ADMINISTRATION TASKS
IN THE CONTRACTING BUSINESS

DIRECTIONS

This section contains statements of business and financial administration tasks done in a contracting business.

Although you may not do these tasks yourself, please rate them as to how often they are done, and how important you feel they are in the operation of your contracting firm.

For each listed task, there are two rating scales: FREQUENCY (how often the task is done) and the IMPORTANCE of the task. Each scale is divided into five possible choices as shown in the table below. Based on your experience, rate each of the listed tasks as to FREQUENCY and IMPORTANCE by CIRCLING THE PROPER RATING SCALE NUMBER.

If there are other business and financial administration tasks you feel are important in the contracting business, please list and rate them in the blank spaces provided.

FREQUENCY	IMPORTANCE
5 All the time	5 Critically important
4 Most of the time	4 Very important
3 Sometimes	3 Important
2 Seldom	2 Some importance
1 Never	1 Unimportant

1. BUSINESS ADMINISTRATION

<u>FREQUENCY</u>	<u>IMPORTANCE</u>	<u>TASK</u>
5 4 3 2 1	5 4 3 2 1	a. Develop, and put into use, policies and procedures for day-to-day business operations
5 4 3 2 1	5 4 3 2 1	b. Make and deal with legal agreements/documents (e.g., contracts, leases, mortgages, notes, etc.)
5 4 3 2 1	5 4 3 2 1	c. Comply with Federal, State and local labor laws and regulations

From: ACSI Task Analysis Report

COMPARATIVE WEIGHTED RANK ORDERING OF TASKS/KNOWLEDGES

G=GENERAL CONTR.; B=BUILDING CONTR.; C=RESIDENTIAL CONTR.

TASK

Table 61: Business Administration Tasks

G	B	R	Task
===	===	===	=====
1	1	1	Keep Business Records
2	2	2	Submit Forms/Reports Required by Fed/State
3	3	3	Make and Deal With Legal Agreements/Documents
4	4	5	Develop Policies and Procedures for Business
5	5	4	Obtain Business Liability and Loss Insurance
6	6	6	Comply with Labor Laws and Regulations
7	7	7	Comply with Health and Safety Laws

Table 62: Financial Administration Tasks

G	B	R	Task
===	===	===	=====
1	1	1	Control Cash Flow
2	2	3	Keep Financial and Accounting Records
3	3	2	Control Credit and Borrowing Needs
4	4	4	Determine Long/Short-Term Capital Needs
5	5	5	Analyze Financial Statements and Reports

Table 63: Contracting Administration Tasks

G	B	R	Task
===	===	===	=====
1	1	1	Prepare Cost Estimates Proposals and Bids
2	2	2	Get Bids and Estimates from Subs and Suppliers
3	3	3	Prepare Change Order Proposals
4	4	5	Draw Up and Submit Payment Requests
5	5	4	Control Project/Job Cash Flow
6	6	6	Draw Up Project/Job Contracts and Agreements
7	7	8	Read/Evaluate Contracts, Subcontracts, Agreements
8	8	7	Submit Contract Forms, Schedules, Insurance, Bonds
9	9	9	Submit Project Required Certifications and Submittals
10	10	10	Get Permits, Licenses and Approvals
11	11	11	File/Release Mechanic's Liens

COMPARATIVE WEIGHTED RANK ORDERING OF TASKS/KNOWLEDGES

Table 64: Project Management Tasks

G	B	R	Task
===	===	===	=====
1	1	1	Comply with Project Plans and Specifications
2	3	4	Control Subcontractor Work and Quality
3	2	2	Identify Problems/Conflicts in Plans and Specs
4	4	3	Coordinate with Other Contractors and Subs
5	7	6	Control Project Budgets
6	9	8	Prepare Time, Labor, Equipment, Material Take-Offs
7	5	7	Supervise Job Site Work and Quality
8	8	10	Determine Work to be Subcontracted
9	6	5	Control Project Progress
10	10	9	Prepare Project Schedules
11	12	12	Keep Records of Work Performed
12	11	11	Order Supplies/Materials
13	13	14	Coordinate with Architects/Engineers
14	15	15	Coordinate with Owners
15	14	13	Schedule Supplies and Materials Deliveries
16	16	16	Set-up Job Site Safety and Protection Plans

KNOWLEDGE

Table 65: Business Administration Knowledge

G	B	R	Knowledge
===	===	===	=====
1	1	1	Insurance Requirements
2	2	2	Business Recordkeeping
3	3	3	Health and Safety Regs for Contracting Businesses
4	4	4	Federal and State Tax Laws and Regulations
5	5	5	Legal Req/Proc for Setting Up Contracting Bus
6	7	6	Labor Laws
7	6	7	Contractor Certification Laws and Regulations
8	8	8	Types of Business Ownership
9	9	9	Laws/Proc for Contracts, Warranties, Guarantees
10	10	10	Business Organization and Management

COMPARATIVE WEIGHTED RANK ORDERING OF TASKS/KNOWLEDGES

Table 66: Financial Administration Knowledge

G	B	R	Knowledge
===	===	===	=====
1	1	1	Cash Management
2	2	2	Basic Business Math
3	3	3	Income Payment Methods
4	4	6	Basic Accounting
5	5	4	Read Financial Plans and Reports
6	6	5	Equip/Property Purchases, Leases and Costs
7	7	8	Credit and Borrowing Methods and Laws
8	8	7	Calculate Depreciation
9	9	9	Calculate and Use Financial Ratios

Table 67: Contracting Administration knowledge

G	B	R	Knowledge
===	===	===	=====
1	1	1	Different Types of Contracts and Subcontracts
2	2	2	Cost Control and Budgeting
3	3	3	Contract Amendments and Change Orders
4	4	4	Basic Math
5	5	5	Project/job Scheduling Methods
6	6	6	Lien Laws and Procedures
7	9	7	Bonding Requirements and Procedures
8	8	9	Material Ordering, Delivery and Payment Methods
9	7	8	Construction Codes and Standards
10	10	10	Bid and Proposal Formats and Preparation
11	11	11	Reading Plans and Specifications
12	12	12	Estimating Methods
13	13	13	Const. Materials, Tools, Equipment and Methods
14	14	14	Permits, Approvals and Inspections

COMPARATIVE WEIGHTED RANK ORDERING OF TASKS/KNOWLEDGES

Table 68: Project Management Knowledge

G	B	R	Knowledge
1	1	1	Reading Plans and Specifications
2	2	2	Project Scheduling Methods
3	6	5	Estimating Methods
4	3	3	Basic Math
5	5	7	Construction Materials, Tools, Equipment and Methods (Very Imp)
6	7	6	Mtl. Ordering, Delivery and Payment Methods
7	4	4	Cost Control and Budgeting
8	8	10	Make/Deal W/ Contract Amend. & Change Orders
9	10	9	Const. Mat., Tools, Equip. & Methods (Import)
10	9	8	Permits, Approvals and Inspections
11	11	11	Construction Codes and Standards
12	12	12	Bid/Proposal Formats and Preparation
13	13	13	Types of Contracts and Subcontracts
14	14	14	Material Handling and Safety

Table 69: Knowledge of Construction Materials, Tools, Equipment, and Methods (*Very Important)

G	B	R	Knowledge
*1	*2	*3	Concrete Formwork
*2	*3	*2	Structural Excavation
*3	*4	*5	Concrete Reinforcement
*4	*1	*1	Truss Erection
*5	9	13	Cast-In-Place and Precast Concrete
*6	8	9	Structural Steel Erection
*7	*5	*4	Rough Carpentry
*8	*6	*8	Sitework
*9	12	11	Pile Installation
*10	18	20	Structural Steel Fabrication
11	10	*6	Finish Carpentry Work
12	11	19	Masonry Work
13	7	10	Roofing (All Types)
14	15	14	Electrical Work
15	19	17	Plumbing Work
16	17	12	Roofing (Shingle)
17	16	18	Mechanical Work
18	13	*7	Finish Work
19	21	16	Truss Fabrication
20	20	21	Drywall, Lath and Plaster
21	14	15	Insulation and Energy Conservation Systems
22	22	23	Equipment Installation
23	23	22	Specialty and Special Construction

APPENDIX B

LICENSING AGENCY INTERVIEW SHEET

Phone _____ Address:

Contact-1 _____

Contact-2 _____

Exec. Dir. _____

TELEPHONE INTERVIEW DATE _____.

FOLLOW UP: Letter sent _____; Rcd. org. charts _____;

Rcd. application forms _____; Rcd. licensing law

_____ : Thank you & results sent _____.

1. History: first (functioning) yr: licensing law _____
2. (grandfather clause?) Y N
3. examination _____
4. disciplinary process... _____
5. Size/scope: number of active prime contractors.... _____
6. newly licensed prime contractors each year. _____
7. average of last 2 yrs fiscal budget (10000) _____
8. licensee: alternative licensing at local level... Y N
9. work category: home improvements.. Y N
10. residential bldg.. Y N
11. bldg. o.t. resid.. Y N
12. general o.t. bldg. Y N
13. lic. holder: qualfyng agnt/RME. Y N
14. business entity... Y N
15. individual..... Y N
16. exceptions: owner-builder Y N

17.	federal govt projects.....	Y N
18.	state govt projects.....	Y N
19.	municipal govt projects.....	Y N
20.	projects under \$amt min.....	Y N
21.	(amount)	_____
22.	Organization:Board: number of members.....	_____
23.	# years in term.....	_____
24.	selection: governor.....	Y N
25.	elected.....	Y N
26.	exec dir/sec selection: governor.....	Y N
27.	elected.....	Y N
28.	umbrella agency...	Y N
29.	industry.....	Y N
30.	exam services: in-house preparation.....	Y N
31.	in-house administering.....	Y N
32.	in-house grading.....	Y N
33.	in-house investigatory staff.....	Y N
34.	in-house legal counsel	Y N
35.	shared services: secretarial.....	Y N
36.	purchasing.....	Y N
37.	data processing.....	Y N
38.	examination.....	Y N
39.	investigations.....	Y N
40.	legal counsel.....	Y N
41.	Entry requirements: minimum age.....	_____
42.	years of experience	_____

43.	(verified)	Y N
44.	minimum education	Y N
45.	(level of)	_____
46.	financial: net worth	Y N
47.	(amt)	_____
48.	credit rating	Y N
49.	(min rating)	_____
50.	working cap.....	Y N
51.	(amt)	_____
52.	bankruptcy?.....	Y N
53.	license bond	Y N
54.	public liability insurance.....	Y N
55.	moral: criminal conviction....	Y N
56.	references	Y N
57.	(verified)	Y N
58.	exam: task analysis base.....	Y N
59.	content: bus/financial	Y N
60.	contract admin	Y N
61.	project mgt..	Y N
_____ OTHER <<<<<<<		
62.	Re-licensing criteria: payment of fee	Y N
63.	license bond verification	Y N
64.	liability insurance verification.	Y N
65.	continuing education requirement.	Y N
66.	re-certification examination.....	Y N
67.	not in bankruptcy	Y N

68.	not under criminal sentence	Y N
69.	not under Board discipline	Y N
70.	Discipline/complaints:forum:formal arbit/mediate.	Y N
71.	preliminary hearings...	Y N
72.	hearings.....	Y N
73.	referral: consumr agncy	Y N
74.	courts	Y N
75.	powers: revoke	Y N
76.	suspend	Y N
77.	fine	Y N
78.	reprimand	Y N
79.	award damages (civil).. <td>Y N</td>	Y N
80.	imprison (criminal)....	Y N
81.	other: contractr recovery fund	Y N
82.	citation system.....	Y N

 OTHER

<<<<<<<<<

83.	Public information on contractors:year licensed..	Y N
84.	exam grade	Y N
85.	discipline status.	Y N
86.	discipline history	Y N
87.	complaint history.	Y N
88.	project history...	Y N
89.	financial status..	Y N
90.	credit rating.....	Y N

 OTHER

<<<<<<<<<<<<

Information request:	1) agency organization chart	Y N
	2) departmental org. chart..	Y N
	3) application forms.....	Y N
	4) copy of licensing law....	Y N

APPENDIX C

PHASE ONE DATA AND VARIABLE DEFINITIONS

Phase One Data

Alabama Through Michigan

ST	L	E	D	Y	B	I	T	R	P	LD	FR	II	WC	CB	BB
AL	35	0	0	0	0	0	0	1	1	1.7	359	15.7	0.0	0.97	-0.31
AK	68	0	0	0	1	1	0	1	5	3.5	23	16.8	15.7	0.03	-0.14
AZ	31	31	31	4	1	0	1	1	5	2.5	40	17.6	14.2	1.77	0.04
AR	64	88	85	5	0	0	1	1	5	1.6	428	12.9	7.4	0.70	0.00
CA	30	30	30	4	1	1	1	1	3	3.2	40	18.0	14.0	0.78	0.69
CO	0	0	0	0	0	0	0	0	0	3.5	113	*	14.7	0.92	0.01
CT	0	0	0	0	0	0	0	0	0	3.6	139	16.6	21.3	-0.09	16.75
DE	69	0	0	0	1	0	0	1	0	2.6	303	12.4	9.3	0.51	0.00
FL	68	68	68	4	0	1	1	1	2	2.8	171	16.7	17.0	0.63	0.57
GA	0	0	0	0	0	0	0	0	0	2.3	458	*	8.7	0.64	0.00
HI	57	57	57	4	1	1	1	1	4	2.7	46	25.3	32.2	1.35	5.64
ID	0	0	0	0	0	0	0	0	0	2.0	49	*	9.6	0.73	0.20
IL	0	0	0	0	0	0	0	0	0	3.3	14	*	15.0	1.07	-0.05
IN	0	0	0	0	0	0	0	0	0	1.7	30	12.4	3.7	0.59	-0.31
IA	0	0	0	0	0	0	0	0	0	2.1	36	15.1	10.0	0.10	0.00
KS	0	0	0	0	0	0	0	0	0	2.3	121	12.7	6.0	1.10	2.79
KY	0	0	0	0	0	0	0	0	0	1.9	310	13.1	7.3	0.36	0.11
LA	55	56	56	0	1	1	0	1	5	2.4	126	14.0	9.2	0.88	0.16
ME	0	0	0	0	0	0	0	0	0	2.2	33	21.5	14.3	-0.40	0.02
MD	27	0	0	0	0	0	0	0	0	3.0	90	15.0	14.0	-0.03	3.41
MA	81	82	0	5	0	0	1	1	5	3.8	16	12.0	14.8	1.82	0.15
MI	66	66	66	0	0	0	1	1	2	2.3	69	11.5	17.7	1.24	2.10

Minnesota Through Utah

<u>ST</u>	<u>L</u>	<u>E</u>	<u>D</u>	<u>Y</u>	<u>B</u>	<u>I</u>	<u>T</u>	<u>R</u>	<u>P</u>	<u>LD</u>	<u>FR</u>	<u>II</u>	<u>WC</u>	<u>CB</u>	<u>BB</u>
MN	0	0	0	0	0	0	0	0	0	2.7	139	15.5	0.0	-0.06	0.16
MS	50	83	50	0	0	0	1	1	5	1.6	103	12.2	7.0	2.57	0.03
MO	0	0	0	0	0	0	0	0	0	2.5	71	14.8	5.9	0.41	-0.24
MT	0	0	0	0	0	0	0	0	0	2.4	140	16.0	26.9	0.19	0.03
NE	0	0	0	0	0	0	0	0	0	2.7	136	14.5	9.0	1.61	0.00
NV	41	65	41	4	1	0	1	1	4	2.5	180	17.5	0.0	0.70	0.10
NH	0	0	0	0	0	0	0	0	0	2.2	44	*	18.5	-0.08	0.00
NJ	77	0	0	0	0	0	0	1	4	3.1	98	*	6.5	-0.20	0.05
NM	78	78	78	4	1	0	1	1	6	2.2	60	14.7	14.4	1.00	-2.26
NY	0	0	0	0	0	0	0	0	0	4.1	236	*	10.4	0.16	-0.27
NC	25	50	50	0	0	0	1	1	5	1.5	681	12.9	5.7	1.52	0.09
ND	37	0	0	0	1	0	0	1	1	1.9	492	*	0.0	-0.37	0.00
OH	0	0	0	0	0	0	0	0	0	2.5	67	*	0.0	3.21	-0.05
OK	0	0	0	0	0	0	0	0	0	2.5	52	13.3	8.8	0.75	3.73
OR	72	0	0	0	1	1	0	1	3	2.8	44	16.0	18.1	0.41	15.11
PA	0	0	0	0	0	0	0	0	0	2.3	49	15.1	14.7	0.40	-0.63
RI	0	0	0	0	0	0	0	0	0	2.6	96	11.5	12.3	1.34	-0.31
SC	30	30	30	3	1	1	1	1	4	1.5	698	12.4	9.4	0.70	-0.52
SD	0	0	0	0	0	0	0	0	0	1.7	57	*	8.2	0.49	0.00
TN	31	86	31	3	0	0	1	1	5	1.9	71	14.7	6.0	2.27	-0.83
TX	0	0	0	0	0	0	0	0	0	2.4	64	*	12.8	1.24	0.40
UT	57	60	57	4	0	0	1	0	2	2.1	71	18.1	7.6	0.63	0.04

Vermont Through Wyoming

<u>ST</u>	<u>L</u>	<u>E</u>	<u>D</u>	<u>Y</u>	<u>B</u>	<u>I</u>	<u>T</u>	<u>R</u>	<u>P</u>	<u>LD</u>	<u>FR</u>	<u>II</u>	<u>WC</u>	<u>CB</u>	<u>BB</u>
VT	0	0	0	0	0	0	0	0	0	2.6	124	17.8	8.2	-0.01	0.00
VA	85	85	85	0	0	0	0	1	4	2.4	298	15.3	8.1	-0.15	0.07
WA	63	0	0	0	1	1	0	0	2	2.6	42	19.0	0.0	0.21	2.75
WV	0	0	0	0	0	0	0	0	0	1.5	342	12.8	0.0	-0.05	2.39
WI	0	0	0	0	0	0	0	0	0	2.2	119	*	10.1	0.11	-0.59
WY	0	0	0	0	0	0	0	0	0	2.2	35	13.6	0.0	0.44	0.00

Alabama Through Michigan

ST	LB	LN	GP	GC	RP	RC	BF	PI	PC
AL	0.09	0.72	2.01	0.73	3.07	-0.64	58	0.12	-0.97
AK	0.44	0.00	-0.84	0.77	-0.59	0.93	54	-0.02	0.61
AZ	0.21	0.00	-0.03	-0.18	-0.02	0.74	73	-0.02	1.86
AR	0.23	0.00	-0.11	0.77	0.14	0.93	61	-0.08	0.49
CA	0.07	-0.19	0.00	0.00	0.00	0.00	114	-0.04	-0.26
CO	0.03	0.12	0.21	-0.18	0.22	0.74	224	*	0.73
CT	-1.14	0.00	1.17	-0.27	0.96	-0.05	24	0.05	-0.60
DE	0.15	0.00	-0.17	0.02	-0.33	-0.80	14	-0.08	0.50
FL	0.09	-0.18	0.32	0.04	-0.16	-0.71	54	-0.16	-1.16
GA	0.05	0.00	-0.46	-0.18	-0.16	0.74	25	*	0.42
HI	0.00	0.09	-1.28	-1.52	-1.48	-1.84	83	-0.30	1.98
ID	0.00	0.00	0.56	-0.18	0.62	0.74	47	*	0.60
IL	0.02	-0.54	0.00	0.00	0.00	0.00	101	*	1.15
IN	0.06	-0.01	0.46	0.77	-0.04	0.93	66	-0.05	-0.78
IA	0.00	2.36	0.24	-0.93	-0.05	-0.30	33	-0.03	0.04
KS	0.06	0.08	-0.66	-0.96	-0.53	-1.66	93	0.13	0.83
KY	0.03	0.00	0.00	0.00	0.00	0.00	83	-0.03	0.12
LA	0.00	0.04	0.02	-0.87	0.18	-1.70	83	-0.17	-0.98
ME	0.00	-0.03	-0.51	-0.93	-0.13	-0.29	16	0.08	-1.27
MD	0.27	0.00	0.69	-0.18	0.20	0.74	39	0.08	-2.44
MA	0.00	0.00	0.00	0.00	0.00	0.00	24	*	1.30
MI	0.26	0.43	1.34	-0.18	0.66	0.74	102	0.11	0.55

Minnesota Through Utah

ST	LB	LN	GP	GC	RP	RC	BF	PI	PC
MN	0.11	0.00	0.03	0.77	0.27	0.93	32	-0.17	-0.35
MS	0.04	2.00	-0.31	0.36	-0.94	-1.25	42	*	2.18
MO	0.03	0.00	0.44	-0.18	0.16	0.74	66	0.06	0.12
MT	0.00	0.00	-0.37	-0.18	0.97	0.74	41	0.04	0.28
NE	0.41	0.00	-1.28	-0.85	-0.95	-1.21	42	-0.07	1.60
NV	0.48	-0.49	0.02	0.77	1.58	0.93	75	-0.26	-7.97
NH	-0.14	0.00	0.08	-0.44	-0.06	-0.99	10	*	-0.10
NJ	0.03	0.00	0.00	0.00	0.00	0.00	43	*	-5.17
NM	0.05	0.00	-0.67	0.77	-0.39	0.93	40	-0.09	1.01
NY	2.48	-0.39	3.19	0.59	2.86	0.02	32	*	-0.46
NC	0.02	0.00	-1.02	-0.27	-0.90	-0.05	33	0.07	0.62
ND	0.01	0.00	-0.71	0.77	-0.29	0.93	21	*	-0.36
OH	0.06	0.00	0.30	0.73	0.05	-0.64	84	*	3.01
OK	0.03	0.00	-0.61	0.00	-0.84	0.00	123	*	0.65
OR	0.10	0.00	-0.21	1.39	-0.24	0.33	76	-0.01	0.48
PA	0.17	0.00	1.93	0.07	1.60	-0.81	51	*	0.24
RI	0.00	0.00	0.16	-2.30	-0.83	-2.05	11	-0.02	0.81
SC	0.13	0.00	-1.80	-1.81	-2.13	-2.45	21	-0.07	0.11
SD	0.12	0.00	-0.21	-0.18	0.19	0.74	24	*	0.51
TN	0.00	0.00	-0.02	-0.27	-0.71	-0.05	102	-0.09	1.97
TX	0.09	0.05	-0.74	-0.47	-0.29	-0.99	89	*	0.93
UT	0.02	0.00	-0.19	0.77	-0.18	0.93	87	0.02	0.80

Vermont Through Wyoming

ST	LB	LN	GP	GC	RP	RC	BF	PI	PC
VT	0.00	0.00	-0.56	-0.21	-0.04	0.25	12	0.33	-0.21
VA	0.08	0.73	-0.59	0.77	-0.77	0.93	66	0.01	-0.94
WA	0.25	0.31	0.43	1.27	0.60	1.01	79	0.12	-0.99
WV	0.31	0.00	-0.65	0.77	-0.76	0.93	35	-0.08	-0.94
WI	-1.06	0.00	0.37	0.77	-0.51	0.93	68	*	0.14
WY	0.01	0.00	0.00	0.00	0.00	0.00	168	0.05	0.34

Variable Definitions

ST, state. These were the United States Postal Service state abbreviations for each state. The 50 states were used. The District of Columbia was not included.

L, licensing. In the raw data file the licensing variable was represented as the first functioning year of the licensing law. Since this research was concerned with the performance effect of licensing it was necessary to allow for passage of some length of time for the effect of licensing to be felt in the pool of active contractors. For purposes of analysis several different groupings were made. From questionnaire item 1, appropriate grouping values were derived for the variable L.

E, examination. In the raw data file this variable was represented as the first functioning year of a competency examination process. Since this variable also impacts on the pool of active contractors over time, several different groupings were made. From questionnaire item 3, appropriate values were derived for the variable E.

D, disciplinary feature. In the raw data file this variable was represented as the first functioning year of a disciplinary process. The variable, D, had appropriate values derived from responses to questionnaire item 4.

Y, years of experience requirement. This variable represented the minimum years of experience requirement for the lowest classification of prime contractor for each state. Response values ranged from 0 to 5 to questionnaire item 42. Variable values of 0 or 1 were used in the analysis.

B, license bond requirement. This variable represents the existence of a requirement for the prime contractor to post a license bond with the agency as a prerequisite to licensing. The variable, B, had values 0 or 1 and was questionnaire item 53.

I, public liability insurance requirement. This variable represented the existence of a requirement for the prime contractor to have public liability insurance coverage for his business as a prerequisite to licensing. The variable, I, had values 0 or 1 and was questionnaire item 54.

T, task analysis base for examination. This variable represented whether or not the competency examination was based on a task analysis. The variable, T, had values 0 or 1 and was questionnaire item 58.

R, agency power to revoke license. This variable was typically the most severe disciplinary power of licensing agencies. This variable indicated whether or not the agency has the power to revoke a prime contractor's license through

its disciplinary process. The variable, R, had values 0 or 1 and was questionnaire item 75.

P, public information index. Questionnaire items 83 through 90 requested specific information on contractors that licensing agencies made available to the public. Responses to questionnaire items 83, 85, 86, 87, 88, and 89 corresponding to year licensed, discipline status, discipline history, complaint history, project history, and financial status, were summed to form an index of availability of information to the public. Responses to each item could be 0 or 1; therefore the variable, P, had values from 0 to 6. Variable values of 0 or 1 were used in the analysis.

LD, lawyer density. This variable was chosen because of the increasing litigiousness in our society. The researcher felt that there may be some relationship evident between the concentration of lawyers and the cost of various types of insurance. This variable was the number of lawyers per 1000 people in each state (Bureau of the Census, 1986). LD ranged in value from a high of 4.1 for New York to a low of 1.45 for West Virginia.

FR, fraud rate. This variable was chosen under the supposition that there may be some relationship between the cost of various types of insurance or business failure rates with the incidence of arrests for fraud. The fraud rate was the number of arrests for fraud per 100,000 inhabitants.

For 1986 it ranged from a low of 14 in Illinois to a high of 698 in South Carolina. Information used to calculate this rate was requested and received from J. Harper Wilson, Chief of the Uniform Crime Reporting Program, U.S. Department of Justice, Federal Bureau of Investigation, July, 7, 1988.

II, injury incidence rate. This rate was from data received from the U. S. Department of Labor on electro-magnetic media. This rate was the injury incidence rate for each participating state in the prime contractor Standard Industrial Classification, SIC, codes 15 and 16 for the year 1986. OSHA occupational injury and death incidence rates were obtained for states that have worked with the Bureau of Labor Statistics in a joint effort to develop statistics that are comparable between states. These data were from the National Technical Information Service Supplementary Data System files. Data for 1980, 1983 and 1986 were obtained directly from the Bureau of Labor Statistics.

WC, worker compensation composite rate. This rate was derived from the worker compensation insurance rate data found in the September 17, 1987, issue of Engineering News Record (Staff, 1987, pp. 74-75). Rates for Carpentry - general, Concrete work - NOC, and Masonry were weighted .4, .4, and .2, respectively, and were combined into a single composite rate. These rates were the cost of worker compensation insurance coverage per \$100 payroll. The composite rates range from a low of 3.7 for Indiana to a

high of 32.2 for Hawaii. Alabama, Minnesota, Nevada, North Dakota, Ohio, Washington, West Virginia, and Wyoming had a monopolistic worker compensation system and no rates were given.

CB, contract bond composite loss ratio. This dependent variable was a composite of information for 1984, 1985, and 1986 for the 17 public and private prime contractor categories of work listed below:

<u>Code</u>	<u>Description</u>
302	Highways and paving - federal
333	Airport buildings - federal
334	Educational buildings - federal
335	Hospitals/clinics - federal
336	Industrial, missile - federal
337	Office buildings - federal
340	Sewer and water treatment - federal
352	Highways
363	Street paving
381	Apartment buildings
382	Commercial buildings
383	Airport buildings
384	Educational buildings
385	Hospitals/clinics
386	Industrial
387	Office
390	Sewer and water treatment

All of these categories except 302, 352, and 363 were within the Surety Association of America's definition of "Class B Contracts," those "involving architectural building construction, related subtrades, most engineering construction, concrete and excavation work and work performed underground or in or under water, except where specifically rated elsewhere in the manual" (Surety Association of America, 1986, p. C-10). Raw data for each year for each category consisted of direct premiums earned and direct losses incurred. The variable, CB, was the loss ratio determined by dividing the aggregate total direct losses incurred by the aggregate total direct premiums earned. The ratios ranged from a low of -.40 for Maine to a high of 3.21 for Ohio.

BB, bid bond loss ratio. This dependent variable was obtained for each state by dividing the sum of total direct losses by total direct premiums earned for the single Code 300 for the years 1984 through 1986. New Mexico had a low of -2.26 and Connecticut a high of 16.75.

LB, license bond loss ratio. This variable, LB, was a composite of two categories with slightly different coverages, but including blanket performance and payment obligation and code compliance. Data for the years 1984 through 1986 were combined, and loss ratios were derived by dividing the aggregate total direct losses by aggregate total direct premiums earned. A low of -1.14 was calculated

for Connecticut and a high of 2.48 was determined for New York.

LN, lien bond loss ratio. The variable LN was quotient of the division of total direct losses by total direct premiums earned for Code 373, lien bonds, for the years 1984 through 1986. These ratios ranged from a low of -.54 for Illinois to a high of 2.36 for Iowa.

GP, general contractor premises and operations insurance premium rate index. Raw data for insurance rate variables were supplied by the Insurance Services Office, Inc. With the exception of Oklahoma, which has only premises and operations insurance, rates for each ISO state were reported for two types of general liability insurance. The two types were premises and operations and completed operations. The 13 construction work categories were sorted into general/heavy contracting and residential/light commercial contracting divisions. The work categories were averaged for each division and a rate index was calculated. The resulting four index numbers were general contractor premises and operations, general contractor completed operations, residential contractor premises and operations, and residential contractor completed operations. Rates were not provided for California, Illinois, Kentucky, Massachusetts, New Jersey and Wyoming.

GC, general contractor completed operations insurance premium rate index. This dependent variable, GC, was

calculated from work category z-scores, sorted, and weighted as described in the preceding paragraph describing GP. The variable measured the relative differences in premium rates among states when compared with other GC rates. Rates were not provided for California, Illinois, Kentucky, Massachusetts, New Jersey, Oklahoma, and Wyoming.

RP, residential contractor premises and operations insurance premium rate index. This dependent variable, RP, was calculated from work category z-scores sorted and weighted as described in the GP paragraph. RP measured the relative differences among states in premises and operations insurance premium rates for residential contractors.

RC, residential contractor completed operations insurance premium rate index. This dependent variable, RC, was calculated from work category z-scores, sorted, and weighted as described under GP. RC measured the relative difference in completed operations insurance premium rates for residential contractors between states.

BF, Business failure rate. The variable, BF, was not the same as the business failure rate determined by Dun and Bradstreet. BF was derived by dividing the sum of 1984 and preliminary 1985 business failures as reported for each state by Dun and Bradstreet by the average number of reporting units classified in SIC divisions 15 and 16 for each state in the 1984 U. S. Statistical Abstract. BF

ranged from a low of 10 for New Hampshire to a high of 224 for Colorado.

PI, performance of injury incidence rate. This dependent variable was the percent of change in injury incidence rate from 1980 to 1986 for each state supplying data to the Bureau of Labor Statistics Supplementary Data System.

PC, performance of contract bond loss ratio. This dependent variable was the percent of change in contract bond loss ratio from the composite years 1978-79-80 to the composite years 1984-85-86. The raw data was obtained from The Surety Association of America, Inc., data sheets for the years indicated.

PN, performance of lien bond loss ratio. This dependent variable was the percent of change in lien bond loss ratio from the composite years 1978-79-80 to the composite years 1984-85-86. The raw data was obtained from The Surety Association of America, Inc., data sheets for the years indicated.

APPENDIX D

APPLICATION FORM FOR FLORIDA EXAMINATION

Florida Certified Contractor's Examination Application

General, Building, Residential Contractors

Examination Dates:

June 26-27, 1987 or **Oct. 22-23, 1987**
(Application Deadline: April 24) (Application Deadline: August 7)

This application is for persons wishing to become certified by the state of Florida as General, Building or Residential Contractors.

The examination is in three parts, and applicants may retake the parts which they fail at the next two successive examinations. If, at the conclusion of the three-exam cycle, all parts have not been passed, all grades are voided and they must start the procedure again.

This booklet contains all information and forms necessary to apply for the examination.

Florida Construction Industry Licensing Board
Post Office Box 2
Jacksonville, Florida 32201

Fee: \$175
(must accompany application)

INSTRUCTIONS AND INFORMATION

In order to receive a state certified contractors license, you must:

1. Prove your eligibility to take the examination.
2. Pass the examination.
3. Meet requirements of financial responsibility.
4. Meet insurance requirements.
5. Comply with any other requirements per Chapter 489, Part 1, Florida Statutes.

This application will determine your eligibility. Fill it out completely and return it to the board office. You will be notified if you are eligible to take the exam.

HOW TO FILL OUT THE APPLICATION

The application form is on the middle four pages of this booklet – pages 3, 4, 5 and 6. These pages should be detached, filled out completely, and returned to the Construction Industry Licensing Board office by the deadline (see page 1.)

You should retain the outer four pages – pages 1, 2, 7 and 8. These pages have the general exam information, plus the reference list of books containing data from which exam questions are taken.

Page 3 is the personal information needed to process your application. It's self-explanatory. Make sure you fill out all parts. Make sure your two photographs are attached in the space at the top left corner.

Page 4 lists the eligibility requirements as stated in Chapter 489, Part 1 of the Florida Statutes. Requirements for all categories are given – you need only to qualify in the category that you have chosen.

Page 5 is your certification that you are eligible for the exam. On this page, you will verify that you are 18 years old, of good moral character, and that you meet the qualifications stated on the previous page for your category. This information must be verified by a person having direct knowledge of your related work experience. Do not have a family member verify your work experience. The best person is someone who has supervised you in the past, or for whom you have been employed. You must have this signed by that person, and that person should understand that affirmation of false information is a violation of the law.

Page 6 is a credit report. Take this to a nationally recognized credit agency and have them verify that you have applied for a credit report. Let them read the instructions – they will run a credit check on you and send the results to us. DO NOT leave this form at the credit agency. It should be returned to the board office. Your credit check is a requirement for licensure.

SENDING THE APPLICATION

When you complete all parts of pages 3, 4, 5 and 6, send it to:

Examinations Section
Construction Industry Licensing Board
P.O. Box 2
Jacksonville, FL 32201

(111 Coast Line Dr. East, Suite 504, Jacksonville, FL 32202)

Include the \$175 fee (check or money order, no cash) made out to DEPARTMENT OF PROFESSIONAL REGULATION. The fee includes a \$100 exam fee and a \$75 application processing fee. Caution: if you check is not honored by your financial institution, you will be ineligible to take the exam.

Be sure to send only the middle four pages of this booklet. The outer four pages contain information you will need.

If possible, you will be assigned an examination site nearest your address. If you wish to be assigned another site, please request it in writing. There are usually three sites: northern (Jacksonville and/or Tallahassee), middle (Orlando, Daytona, Lakeland and/or Tampa) and southern (Miami area).

ADMISSION TO THE EXAMINATION

If you are certified eligible for the examination, you will receive an admission card about 10 days prior to the exam dates.

If you are not eligible, or if the office requires more information, you will be contacted as soon as that determination is made.

TAKING THE EXAMINATION

Doors will open at 7 a.m., the examination starts at 8:30 a.m., and you should arrive no later than 8 a.m. to check in.

It is an open-book exam. you may bring any approved reference material (see page 7) you wish. Battery-powered, silent calculators are approved, but no electronic device with a memory capability will be allowed.

No smoking or eating will be allowed in the exam room.

Prior to the exam, you will be given further information by the head proctor.

GRADES AND LICENSURE

Results will be mailed approximately 4-6 weeks after the examination.

IF YOU PASS: You will receive a request for additional information needed for licensure. Passing the exam does not guarantee you will be licensed, as you must comply with the financial responsibility and insurance requirements. You will receive this information along with your grade.

IF YOU FAIL: You will receive credit for the parts you pass, and you'll get an application for a retake. This should be returned immediately if you wish to try again at the next exam. You'll also get material on the review procedure. Remember: you have three chances to pass all parts of the exam. If you have not successfully completed the exam by then, you will have to start over.

STAPLE TWO
PHOTOGRAPHS SHOWING
HEAD AND SHOULDERS
FRONT VIEW
SIZE 2" x 2"



STATE OF FLORIDA
DEPARTMENT OF PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY
LICENSING BOARD
P.O. Box 2
Jacksonville, Florida 32201
Telephone (904) 359-6310

THIS SPACE
RESERVED FOR BOARD USE

APPLICATION FOR EXAMINATION FOR LICENSURE

CIRCLE EXAM THAT YOU ARE APPLYING FOR (One Only)				CIRCLE DATE THAT YOU ARE APPLYING FOR (One Only)			
General		Building		Residential		June 26-27	
						October 22-23	
SECTION 1: PROFILE INFORMATION							
Full Name		Last		First		Middle	
Home Address		Street & No.		Apt. No.		Box No.	
		City		County		State	
						Zip	
We are required to ask that you furnish the following information as part of your voluntary compliance with section 2 Uniform Guidelines on Employee Selection Procedures (EEOE) 41 FR 62324 (August 25, 1976). This information is gathered for statistical and reporting purposes only and does not in any way affect your candidacy for licensure.							
Social Security No.		SEX: <input type="checkbox"/> Male <input type="checkbox"/> Female		RACE: <input type="checkbox"/> Caucasian <input type="checkbox"/> Oriental		<input type="checkbox"/> Black <input type="checkbox"/> Native American	
						<input type="checkbox"/> Hispanic <input type="checkbox"/> Other	
Date of Birth:		Place of Birth:		City		State	
						Nation	
Have you ever applied for a Florida certified contractor's exam before? YES <input type="checkbox"/> NO <input type="checkbox"/>							
If "YES" give month and year of last application: February _____ June _____ October _____ Year _____							
Result of last application: Passed _____ Failed _____ Denied _____ Voluntarily Withdrew _____ Did not show _____							
List any State of Florida certified contractor license number you currently hold:							
SECTION 2: BUSINESS INFORMATION							
APPLICANT TO CONDUCT BUSINESS AS (Check One Only)							
<input type="checkbox"/> Individual <input type="checkbox"/> Individual Proprietorship <input type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Other (specify) _____							
NAME OF BUSINESS (Attach name under which you will pull construction permit)							
ADDRESS OF BUSINESS							
		Street		City		State	
						Zip	
SECTION 3: EDUCATION (Attach Transcript or Copy of Diploma)							
CIRCLE LAST YEAR COMPLETED: Grade School 1 2 3 4 5 6 7 8 High School 9 10 11 12 College 1 2 3 4 5 6 7 8							
School	Name and Address	Dates Attended Month/Year	Did you Qualify?	Hours Completed Qtr. or Sem.	Major	Degree	
High School			<input type="checkbox"/> Yes <input type="checkbox"/> No				
Jr. College			<input type="checkbox"/> Yes <input type="checkbox"/> No				
College or University			<input type="checkbox"/> Yes <input type="checkbox"/> No				

ELIGIBILITY

All applicants must be at least 18 years of age, be of good moral character and meet one of these three criteria:

1. Have received a baccalaureate degree from an accredited 4-year college in the appropriate field of engineering, architecture, or building construction and have one full year of proven experience in his/her category. A minimum of 2,000 man-hours equates to one year.
2. Have at least 3 years of active experience as a workman who has learned his trade by serving as an apprentice or as a skilled workman who is able to command the rate of a mechanic in his/her particular trade, and has at least 1 year of active experience at the level of foreman who is in charge of a group of workmen and usually is responsible to a superintendent or a contractor or his/her equivalent.
3. Have a combination of not less than 1 year of experience as a foreman and not less than 3 years of credits from any accredited college-level courses; or has a combination of not less than 2 years of experience as a skilled workman, 1 year of experience as a foreman, and not less than 1 year or credits from any accredited college-level courses. All junior college or community college level courses are considered acceptable.

PLUS, you must meet the additional criteria for your trade (see below additional requirements by trade).

**PLEASE NOTE: BE SURE YOU ARE QUALIFIED BEFORE YOU APPLY!
INSUFFICIENT EXPERIENCE IS THE MAIN REASON THAT APPLICANTS ARE
TURNED DOWN.**

ADDITIONAL REQUIREMENTS BY TRADE

In qualifying for a classification under the provisions of (1), (2), or (3) as listed above, an applicant must possess the following requirements in his/her particular trade:

GENERAL CONTRACTOR: A minimum of one year of structurally-related experience on building of four or more stories. The definition of "structurally-related experience" refers to experience in four or more of the following areas: sitework, excavation, footings, piles and pile caps, laying concrete slabs/decks, masonry walls, steel erection, trusses, reinforcement bar, column erection or formwork. Any other area is NOT acceptable.

BUILDING CONTRACTOR: A minimum of one year of structurally-related experience in construction of commercial or industrial buildings, or multiple dwelling residential buildings, up to three stories. (A multiple dwelling residential building is one containing four or more connected residences.) The definition of "structurally-related experience" refers to experience in four or more of the following areas: sitework, excavation, footings, piles and pile caps, laying concrete slabs/decks, masonry walls, steel erection, trusses, reinforcement bar, column erection or formwork. Any other area is NOT acceptable.

RESIDENTIAL CONTRACTOR: Structurally-related experience in residential construction. "Structurally-related experience" refers to experience in four or more of the following areas: sitework, excavation, footings, pile and pile caps, laying concrete slabs/decks, masonry walls, trusses, reinforcement bar or framework. Any other area is NOT acceptable.

APPLICANT STATEMENT

Please sign below. If you will be qualifying on behalf of a corporation, partnership or joint venture, each officer or partner must also sign. If you answer "Yes" to either of the below statements, please attach a full explanation giving the nature of the offense, dates and place of offense:

1. Has any person named above been convicted of acting in the capacity of a contractor without a license or, if licensed as a contractor in this or any other state, has any disciplinary action (including probation, fine or reprimand) ever been taken against such license by a state, county or municipality?
2. Has any person named above ever been convicted of any offense in this state or elsewhere, other than traffic violations?

STATEMENT: I affirm that the information I have given in this application is true and accurate, and I understand that any willful falsification constitutes grounds for disqualification. If I, or any other signer, is currently a licensee, I understand that action may be taken against my (our) license(s) if untrue statements are made in this application.

Applicant's Signature	Print Name	Date		Address (P.O. Box not acceptable)
Signature of Partner or Corporate Officer	Print Name	Date	Title	Address (P.O. Box not acceptable)
Signature of Partner or Corporate Officer	Print Name	Date	Title	Address (P.O. Box not acceptable)
Signature of Partner or Corporate Officer	Print Name	Date	Title	Address (P.O. Box not acceptable)

CERTIFICATION OF EXPERIENCE

This form must be completed by a person having direct knowledge of the applicant's related work experience. Please refer to the qualifications stated on the previous page.

This is NOT for use as a character reference.

The person verifying the applicant's experience preferably has served as his or her supervisor or employer. A family member is NOT considered acceptable.

Person Verifying Experience For _____		
Name _____	Applicant's Name Telephone () _____	
Address _____	City _____	Zip _____
Relationship to applicant (employer, supervisor, etc.) _____		
Job (s) held by applicant (only those applicable) Workman / Mechanic Journeyman Foreman Superintendent Other (Explain below)	From: Month / Year _____ _____ _____ _____	To: Month / Year _____ _____ _____ _____
Scope of work performed: (include corresponding dates) Those applying for General, Building or Residential exam MUST show 1 year of <u>structurally</u> related experience.	From: Month / Year _____ _____ _____ _____	To: Month / Year _____ _____ _____ _____
Type of building, jobs, projects, structures or equipment worked on (include dates) :		
Other pertinent information:		
Note: Any false information provided on this form will subject the person completing the form to prosecution pursuant to Section 837.06 Florida Statutes (1979) and, if licensed, to disciplinary action pursuant to Section 455.227(1) (c) , F.S. (1979)	I certify that the foregoing is true and correct. _____ Signature of person verifying experience _____ Date	

APPLICATION FOR CREDIT REPORT

1. The APPLICANT is to complete the top portion of this form.
2. The applicant's CREDIT AGENCY is to complete the bottom portion of this form.
3. Return this Attachment *along with* your application. (Your credit report will be sent directly to the Board by the credit agency.)

TO BE COMPLETED BY APPLICANT

I certify that I have applied for a credit report from a *nationally recognized credit agency* pursuant to Chapter 489, Part 1, Florida Statutes. I understand that the cost of this credit report shall be paid by me. I further understand that the

financial information provided to the Construction Industry Licensing Board by the credit agency shall be held as confidential. All other information shall become a public record.

_____ Print name of Applicant

_____ If qualifying with a corporation or a partnership, the name of the corporation or partnership. If

_____ qualifying as an individual, the individual's address.

_____ Date

NOTE: If qualifying with a corporation or partnership the credit report shall reflect the credit history of the corporation or partnership. If qualifying as an individual, the credit report shall reflect the credit history of the individual.

TO BE COMPLETED BY CREDIT AGENCY

Credit Agency Please Note: The credit report shall reflect a search of the public records so as to disclose any judgments, liens and/or bankruptcies that may be a part thereof. The credit report shall state that such search was made.

_____ hereby certifies that
(Name of Credit Agency)

_____ has applied for a credit report
(Name of Individual Partnership or Corporation)

The financial report will be held as confidential by The Construction Industry Licensing Board. Send report directly to The Construction Industry Licensing Board. P.O. Box 2, Jacksonville, Florida 32201.

_____ Name of Credit Agency

_____ Address

_____ Signature of Authorized Person

_____ Title _____ Date

Reference Book List

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The books listed below have been used in preparing the examination.

You may bring any book listed into the exam room and use it during the examination. If a book is not on this list, it will not be permitted in the room.

Some books are applicable to only one or two categories, and are indicated -- G: General, B: Building, R: Residential.

FINANCIAL ADMINISTRATION

Builder's Guide to Accounting, Thomsett, Carlsbad, CA., Craftsman Book Co., 1979
Employer's Tax Guide, Series E, Pub 15. Internal Revenue Service, Department of Treasury, January 1987

BUSINESS ADMINISTRATION

Construction Contracting, Clough, 5th ed. New York. John Wiley & Sons, 1986
Florida Construction Law Manual, Leiby, Shepard's/McGraw-Hill, 1981 (with cumulative supply through 1985)
Publications of the U.S. Dept. of Labor, Employment Standards Admin., Wage and Hour Division
Nandy Reference Guide to the Fair Labor Standards Act, WH Pub 1282, revised 6/83
Overtime Compensation Under the Fair Labor Standards Act, WH Pub 1325, revised 4/85
Information for Business Taxpayers, Pub 583, Internal Revenue Service, Pub 583
Mechanic's Lien Law - Chapter 713, Florida Statutes, 1985 or later. Department of State, Tallahassee
Publications of Florida Department of Labor and Employment Security, Tallahassee:
Facts About Workers' Compensation Insurance for Employers, A-2, 1983 or later
Workers' Compensation and You
Wage Loss and You (Questions and Answers)
Florida Unemployment Compensation, Employer Handbook, 1986
General Conditions of the Contract for Construction, A-201. American Inst. of Architects

CONTRACT ADMINISTRATION AND PROJECT MANAGEMENT

Publications of American Institute of Architects, Washington, DC.
Contractor's Qualification Statement, A305 (G and B only)
Standard Form of Agreement Between Contractor and Subcontractor, A401
Instructions to Bidders, A1A A701 (G and B only)
Change Order, A1A G701
Application and Certificate of Payment, A1A G702 & 703
Certificate of Insurance, A1A G705 (G and B only)
Release of Lien, A1A G706
Construction Contracting, Clough, 5th ed. New York. John Wiley & Sons, 1986 (R only)
Mechanical and Electrical Systems in Construction and Agriculture, Dogostino (G and B only)
Carpentry, Kozal, Aalip II. American Technical Publishers, 1985.
Florida Construction Law Manual, Leiby, Shepard's/McGraw-Hill, 1981 (with cumulative supply through '85)
Principles and Practices of Heavy Construction, Smith and Andres, 3rd ed. (G and B only)
O.S.H.A. 2207 (Construction Industry Standards), 1985. Florida Dept. of Labor
General Conditions of the Contract for Construction, A201. American Inst. of Architects, 1976
Standard Building Code, Southern Standard Bldg. Code Congress, 1985 ed. with 1986 amendments
S.P.T.B. Grading Rules, Southern Pine Inspection Bureau, 1977 with 15 supplements.
Walker's Building Estimators Reference Book, 22nd ed., 1986
Walker's Insulation Techniques and Estimating Handbook, 2nd ed., 1983
Publications of Portland Cement Association, Skokie, IL
Design and Control of Concrete Mixtures, 12th ed., 1979
Concrete Masonry Handbook for Architects, Engineers and Builders, 4th ed., 1976
Recommended Spec. for Application and Finishing of Gypsum Board, GA-216-85. Gypsum Association
Architectural and Building Trades Dictionary, Putnam and Carlson, 3rd ed., 1980. Amer. Technical Soc.
Formwork for Concrete, 4th ed., 1984. Amer. Concrete Inst. (Ch. 14 not required for G and B; Ch. 12, 13, 14, 15, 16 & 17 not required for R)
Publications by National Forest Products Association
Manual for House Framing, No. 1, Wood Construction Data, 1978 or later
Plank and Beam Framing for Residential Building, No. 4, Wood Construction Data, 1979 or later
Design of Wood Frame Structures for Permanence, No. 6, Wood Construction Data, 1980
Florida Efficiency Code for Building Construction, 1986 or later. Dept. of Community Affairs.
(Applicable sections: 1, 2, 4, 5, 9 & 10. Sections cannot be obtained separately)
Publications by the Truss Plate Institute, Madison, WI
Handling and Erecting Wood Trusses, HET-80
Bracing Wood Trusses, BWT-76
Placing Reinforcing Bars, 5th ed., 1986. Concrete Reinforcing Institute (G and B only)
Manual of Steel Construction, 8th ed., 1980. Amer. Institute of Steel Const., Chicago. (G and B only)

RECOMMENDED ADDITIONAL STUDY REFERENCES

(Not required references)

Practical Mathematics, Hobbs and McKinney, 3rd ed. American Technical Institute
Related Mathematics for Carpenters, 2nd ed., 1973. American Technical Institute
Blueprint Reading for the Building Trades, 1985. Craftsman Book Co.

DID YOU...

- ☐ Fill out all sections of this application?
- ☐ Have a nationally-recognized Credit Bureau sign this application, and affirm that it will send the information to the Construction Industry Licensing Board?
- ☐ Include two (2) full-face passport-type photographs taken within the last six months? (Polaroid-type photos are not acceptable).
- ☐ Fully document your experience? (This would include items such as a notarized photocopy of your college diploma, a transcript of your grades which is signed by the registrar, or documentation of 2,000 hours of work experience.)
- ☐ Include a check or money order (no cash, please) for \$175 made out to DEPARTMENT OF PROFESSIONAL REGULATION?
- ☐ Double check everything?

REMEMBER: If your application is incomplete, or if there is incorrect information, you are jeopardizing your chances to take the examination. Make sure that you've done everything!

Return your application to:

Florida Construction Industry Licensing Board
Post Office Box 2
Jacksonville, Florida 32201

Construction Industry Licensing Board
Post Office Box 2
Jacksonville, Florida 32201

APPENDIX E

DEPARTMENT OF PROFESSIONAL REGULATION
EXAMINATION SURVEY FORM

1. Of the following, what is the highest level of education that you completed?
 - A. Bachelor's degree or above in Building Construction
 - B. Bachelor's degree or above in Architecture
 - C. Bachelor's degree or above in Civil Engineering
 - D. Bachelor's degree or above in Mechanical Engineering
 - E. Bachelor's degree or above in Sanitary Engineering
 - F. Bachelor's degree or above in Business Administration
 - G. Bachelor's degree or above in any other field
 - H. Associate degree in the field for which you are seeking certification
 - J. Three years of college - no degree
 - K. Two years of college - no degree
 - L. One year of college - no degree
 - M. High school diploma
 - N. None of the above
2. Of the following, what is the highest level of vocational training that you have completed?
 - A. Vocational program in the field for which you are seeking certification
 - B. Union-sponsored apprenticeship program in the field for which you are seeking certification
 - C. Non-union-sponsored apprenticeship program in the field for which you are seeking certification
 - D. None of the above
3. Are you currently a licensed contractor in any other state in the category for which you are seeking certification?
 - A. Yes
 - B. No
4. Are you currently a locally registered contractor in Florida in the category for which you are seeking certification?
 - A. Yes
 - B. No

5. Are you attempting to upgrade your current Florida certification (For example, from a residential contractor to a building contractor, or from an Air "B" contractor to an Air "A" contractor)?
- A. Yes
 - B. No
6. What type of local or out-of-state trade license do you hold in the category for which you are seeking certification?
- A. Journeyman
 - B. Master
 - C. None of the above
7. How many years of experience do you have in the field for which you are seeking certification? Include all years in that field whether as a contractor or as an employee. One year equals at least 1600 hours.
- A. 1-2
 - B. 3-4
 - C. 5-6
 - D. 7-8
 - E. 9-10
 - F. 11-12
 - G. 13-14
 - H. 15-16
 - I. 17-18
 - J. 19-20
 - K. Over 20
8. How many times have you previously taken the Florida certification exam in the category for which you are now seeking certification?
- A. None - This is the first time I'm taking the exam in this category.
 - B. 1
 - C. 2
 - D. 3
 - E. 4
 - F. 5 or more

9. How many hours did you spend studying for this examination? Do not include time spent in an exam preparation school or class.
- A. Less than 20
 - B. 20-39
 - C. 40-59
 - D. 60-79
 - E. 80-99
 - F. 100-149
 - G. 150-200
 - F. Over 200
10. How many hours did you spend in an exam preparation school or class preparing for this exam?
- A. None - I did not attend an exam preparation school or class
 - B. 1-5
 - C. 6-10
 - D. 11-15
 - E. 16-20
 - F. 21-30
 - G. 31-40
 - H. 41-50
 - I. 51-70
 - J. 71-90
 - K. Over 90
11. Which exam preparation school or class did you attend? If you attended more than one, select the last one attended.
- A. None - I did not attend an exam preparation school or class.
 - B. Construction Air Conditioning Academy
 - C. Carl Mathews Construction School
 - D. Contractors School
 - E. Contractors Exam School
 - F. Dave Buster's School of Construction
 - G. Florida Construction School
 - H. Construction Education Services
 - J. Blaise School of Construction
 - K. Other (please list) _____

12. What was the approximate cost of your preparation school or class?
- A. None - I did not attend an exam preparation school or class.
 - B. \$ 0 to 300
 - C. 301 to 500
 - D. 501 to 700
 - E. 701 to 900
 - F. 901 to 1100
 - G. 1101 to 1300
 - H. 1301 to 1500
 - I. Over 1500
13. How much did you pay for the books used for this examination?
- A. Less than \$100
 - B. \$ 100 to 300
 - C. 301 to 500
 - D. 501 to 700
 - E. 701 to 900
 - F. 901 to 1100
 - G. Over 1100
14. Other than payments for books or for an exam preparation school or class, how much did you pay for other expenses related to this exam (such as travel, lodging, etc.)?
- A. Less than \$100
 - B. \$ 100 to 300
 - C. 301 to 500
 - D. 501 to 700
 - E. 701 to 900
 - F. 901 to 1100
 - G. 1101 to 1300
 - H. 1301 to 1500
 - I. Over 1500
15. Your sex:
- A. Male
 - B. Female

16. Your race:

- A. Caucasian - non Hispanic
- B. Hispanic
- C. Black
- D. Oriental
- E. American Indian
- F. Other (please list) _____

17. Was the licensing application form clearly written and easily understandable? If not, please explain why not on the back of this booklet.

- A. Yes
- B. No

THANK YOU!

APPENDIX F

EXAMINEE ATTRIBUTE FREQUENCIES

Table F-1

College Degree by Outcome

	Frequency Percent Row Pct Col Pct	Fail	Pass	Total
College Degree	Architecture	29 6.26 70.73 13.68	12 2.59 29.27 4.78	41 8.86
	Building Construction	40 8.64 44.44 18.87	50 10.80 55.56 19.92	90 19.44
	Business Administration	49 10.58 44.95 23.11	60 12.96 55.05 23.90	109 23.54
	Civil Engineering	20 4.32 33.33 9.43	40 8.64 66.67 15.94	60 12.96
	Mechanical Engineering	10 2.16 55.56 4.72	8 1.73 44.44 3.19	18 3.89
	Other Degree	64 13.82 44.14 30.19	81 17.49 55.86 32.27	145 31.32
	Total	212 45.79	251 54.21	463 100.00

Table F-2

Level of Education by Outcome

	Frequency	OUTCOME	
	Percent	FAIL	PASS
Row Pct			
Col Pct			Total
NONE OF THE	45	11	56
BELOW	3.27	0.80	4.07
	80.36	19.64	
	5.23	2.13	
HIGH SCHOOL	258	74	332
DIPLOMA	18.74	5.37	24.11
	77.71	22.29	
	30.00	14.31	
SOME COLLEGE	345	181	526
	25.05	13.14	38.20
	65.59	34.41	
	40.12	35.01	
COLLEGE	212	251	463
DEGREE	15.40	18.23	33.62
	45.79	54.21	
	24.65	48.55	
Total	860	517	1377
	62.45	37.55	100.00

Frequency Missing = 19

Table F-3

Years of Experience by Outcome

YEARS OF EXPERIENCE	Frequency Percent Row Pct	OUTCOME		Total
	Col Pct	FAIL	PASS	
1-6		185	177	362
		13.41	12.83	26.23
		51.10	48.90	
		21.41	34.30	
7-12		314	185	499
		22.75	13.41	36.16
		62.93	37.07	
		36.34	35.85	
13-18		192	90	282
		13.91	6.52	20.43
		68.09	31.91	
		22.22	17.44	
19 +		173	64	237
		12.54	4.64	17.17
		73.00	27.00	
		20.02	12.40	
Total		864	516	1380
		62.61	37.39	100.00

Frequency Missing = 16

Table F-4

Level of Education by Years of Experience for Examinees
Failing Exam

	Frequency	YEARS OF EXPERIENCE				Total
	Percent Row Pct Col Pct	1-6	7-12	13-18	19 +	
NONE OF THE BELOW		3	10	10	21	44
		0.35	1.18	1.18	2.47	5.17
		6.82	22.73	22.73	47.73	
		1.65	3.24	5.26	12.35	
HIGH SCHOOL DIPLOMA		35	101	65	57	258
			11.87	7.64	6.70	30.32
		13.57	39.15	25.19	22.09	
		19.23	32.69	34.21	33.53	
SOME COLLEGE		60	137	78	65	340
		7.05	16.10	9.17	7.64	39.95
		17.65	40.29	22.94	19.12	
		32.97	44.34	41.05	38.24	
COLLEGE DEGREE		84	61	37	27	209
		9.87	7.17	4.35	3.17	24.56
		40.19	29.19	17.70	12.92	
		46.15	19.74	19.47	15.88	
Total		182	309	190	170	851
		21.39	36.31	22.33	19.98	100.00

Frequency Missing = 24

Table F-5

Level of Education by Years of Experience for Examinees
Passing Exam

Frequency Percent Row Pct Col Pct	YEARS OF EXPERIENCE				Total
	1-6	7-12	13-18	19 +	
NONE OF THE	2	3	5	1	11
BELOW	0.39	0.58	0.97	0.19	2.14
	18.18	27.27	45.45	9.09	
	1.13	1.64	5.62	1.56	
HIGH SCHOOL	15	30	13	15	73
DIPLOMA	2.92	5.85	2.53	2.92	14.23
	20.55	41.10	17.81	20.55	
	8.47	16.39	14.61	23.44	
SOME COLLEGE	45	74	38	23	180
	8.77	14.42	7.41	4.48	35.09
	25.00	41.11	21.11	12.78	
	25.42	40.44	42.70	35.94	
COLLEGE	115	76	33	25	249
DIPLOMA	22.42	14.81	6.43	4.87	48.54
	46.18	30.52	13.25	10.04	
	64.97	41.53	37.08	39.06	
Total	177	183	89	64	513
	34.50	35.67	17.35	12.48	100.00

Frequency Missing = 8

Table F-6

Level of Education by Years of Experience for All Examinees Taking Exam

Frequency Percent Row Pct Col Pct	YEARS OF EXPERIENCE				Total
	1-6	7-12	13-18	19 +	
NONE OF THE	5	13	15	22	55
BELOW	0.37	0.95	1.10	1.61	4.03
	9.09	23.64	27.27	40.00	
	1.39	2.64	5.38	9.40	
HIGH SCHOOL	50	131	78	72	331
DIPLOMA	3.67	9.60	5.72	5.28	24.27
	15.11	39.58	23.56	21.75	
	13.93	26.63	27.96	30.77	
SOME COLLEGE	105	211	116	88	520
	7.70	15.47	8.50	6.45	38.12
	20.19	40.58	22.31	16.92	
	29.25	42.89	41.58	37.61	
COLLEGE	199	137	70	52	458
DEGREE	14.59	10.04	5.13	3.81	33.58
	43.45	29.91	15.28	11.35	
	55.43	27.85	25.09	22.22	
Total	359	492	279	234	1364
	26.32	36.07	20.45	17.16	100.00

Frequency Missing = 32

APPENDIX G

HARM AND PERFORMANCE RANKINGS

Table G-1

States in Order of Injury Incidence Rate

	ST	HWL	II
1	HI	-1	25.3
2	ME	-1	21.5
3	WA	-1	19.0
4	UT	-1	18.1
5	CA	-1	18.0
6	VT	-1	17.8
7	AZ	-1	17.6
8	NV	-1	17.5
9	AK	-1	16.8
10	FL	-1	16.7
11	CT	-1	16.6
12	MT	-1	16.0
13	OR	-1	16.0
14	AL	0	15.7
15	MN	0	15.5
16	VA	0	15.3
17	IA	0	15.1
18	PA	0	15.1
19	MD	0	15.0
20	MO	0	14.8
21	TN	0	14.7
22	NM	0	14.7
23	NE	0	14.5
24	LA	0	14.0
25	WY	0	13.6
26	OK	1	13.3
27	KY	1	13.1
28	NC	1	12.9
29	AR	1	12.9
30	WV	1	12.8
31	KS	1	12.7
32	IN	1	12.4
33	SC	1	12.4
34	DE	1	12.4
35	MS	1	12.2
36	MA	1	12.0
37	MI	1	11.5
38	RI	1	11.5

Ohio, Illinois, Texas, Colorado, Idaho, South Dakota, Georgia, Wisconsin, New Hampshire, North Dakota, New York, and New Jersey has missing values.

Table G-2

States in Order of Injury Incidence Rate Performance

	ST	HWP	PI
1	VT	-1	0.33
2	KS	-1	0.13
3	AL	-1	0.12
4	WA	-1	0.12
5	MI	-1	0.11
6	ME	-1	0.08
7	MD	-1	0.08
8	NC	-1	0.07
9	MO	-1	0.06
10	WY	-1	0.05
11	CT	-1	0.05
12	MT	0	0.04
13	UT	0	0.02
14	VA	0	0.01
15	OR	0	-0.01
16	AZ	0	-0.02
17	RI	0	-0.02
18	AK	0	-0.02
19	KY	0	-0.03
20	IA	0	-0.03
21	CA	0	-0.04
22	IN	0	-0.05
23	NE	1	-0.07
24	SC	1	-0.07
25	DE	1	-0.08
26	AR	1	-0.08
27	WV	1	-0.08
28	TN	1	-0.09
29	NM	1	-0.09
30	FL	1	-0.16
31	MN	1	-0.17
32	LA	1	-0.17
33	NV	1	-0.26
34	HI	1	-0.30

OHIO, MISSISSIPPI, MASSACHUSETTS, ILLINOIS, TEXAS, COLORADO, Oklahoma, Idaho, South Dakota, Georgia, Pennsylvania, Wisconsin, New Hampshire, North Dakota, New York, and New Jersey has missing values.

Table G-3

States in Order of Contract Bond Loss Ratio

	<u>ST</u>	<u>HCL</u>	<u>CB</u>
1	OH	-1	3.21
2	MS	-1	2.57
3	TN	-1	2.27
4	MA	-1	1.82
5	AZ	-1	1.77
6	NE	-1	1.61
7	NC	-1	1.52
8	HI	-1	1.35
9	RI	-1	1.34
10	MI	-1	1.24
11	TX	-1	1.24
12	KS	-1	1.10
13	IL	-1	1.07
14	NM	-1	1.00
15	AL	-1	0.97
16	CO	-1	0.92
17	LA	-1	0.88
18	CA	0	0.78
19	OK	0	0.75
20	ID	0	0.73
21	NV	0	0.70
22	AR	0	0.70
23	SC	0	0.70
24	GA	0	0.64
25	UT	0	0.63
26	FL	0	0.63
27	IN	0	0.59
28	DE	0	0.51
29	SD	0	0.49
30	WY	0	0.44
31	OR	0	0.41
32	MO	0	0.41
33	PA	0	0.40
34	KY	0	0.36

Table G-3--Continued.

	<u>ST</u>	<u>HCL</u>	<u>CB</u>
35	WA	1	0.21
36	MT	1	0.19
37	NY	1	0.16
38	WI	1	0.11
39	IA	1	0.10
40	AK	1	0.03
41	VT	1	-0.01
42	MD	1	-0.03
43	WV	1	-0.05
44	MN	1	-0.06
45	NH	1	-0.08
46	CT	1	-0.09
47	VA	1	-0.15
48	NJ	1	-0.20
49	ND	1	-0.37
50	ME	1	-0.40

Table G-4

States in Order of Contract Bond Loss Ratio Performance

	<u>ST</u>	<u>HPC</u>	<u>PC</u>
1	OH	-1	3.01
2	MS	-1	2.18
3	HI	-1	1.98
4	TN	-1	1.97
5	AZ	-1	1.86
6	NE	-1	1.60
7	MA	-1	1.30
8	IL	-1	1.15
9	NM	-1	1.01
10	TX	-1	0.93
11	KS	-1	0.83
12	RI	-1	0.81
13	UT	-1	0.80
14	CO	-1	0.73
15	OK	-1	0.65
16	NC	-1	0.62
17	AK	-1	0.61
18	ID	0	0.60
19	MI	0	0.55
20	SD	0	0.51
21	DE	0	0.50
22	AR	0	0.49
23	OR	0	0.48
24	GA	0	0.42
25	WY	0	0.34
26	MT	0	0.28
27	PA	0	0.24
28	WI	0	0.14
29	MO	0	0.12
30	KY	0	0.12
31	SC	0	0.11
32	IA	0	0.04
33	NH	0	-0.10

Table G-4--Continued

	<u>ST</u>	<u>HPC</u>	<u>PC</u>
34	VT	1	-0.21
35	CA	1	-0.26
36	MN	1	-0.35
37	ND	1	-0.36
38	NY	1	-0.46
39	CT	1	-0.60
40	IN	1	-0.78
41	VA	1	-0.94
42	WV	1	-0.94
43	AL	1	-0.97
44	LA	1	-0.98
45	WA	1	-0.99
46	FL	1	-1.16
47	ME	1	-1.27
48	MD	1	-2.44
49	NJ	1	-5.17
50	NV	1	-7.97

Table G-5

States in Average Liability Insurance Premium Index Order

	<u>ST</u>	<u>HPL</u>	<u>AP</u>
1	NY	-1	3.025
2	AL	-1	2.540
3	PA	-1	1.765
4	CT	-1	1.065
5	MI	-1	1.000
6	NV	-1	0.800
7	ID	-1	0.590
8	WA	-1	0.515
9	MD	-1	0.445
10	MO	-1	0.300
11	MT	-1	0.300
12	CO	-1	0.215
13	IN	-1	0.210
14	OH	-1	0.175
15	MN	-1	0.150
16	LA	0	0.100
17	IA	0	0.095
18	FL	0	0.080
19	AR	0	0.015
20	NH	0	0.010
21	SD	0	-0.010
22	AZ	0	-0.025
23	WI	0	-0.070
24	UT	0	-0.185
25	OR	0	-0.225
26	DE	0	-0.250
27	VT	0	-0.300
28	GA	0	-0.310
29	ME	0	-0.320

Table G-5--Continued.

	<u>ST</u>	<u>HPL</u>	<u>AP</u>
30	RI	1	-0.335
31	TN	1	-0.365
32	ND	1	-0.500
33	TX	1	-0.515
34	NM	1	-0.530
35	KS	1	-0.595
36	MS	1	-0.625
37	VA	1	-0.680
38	WV	1	-0.705
39	AK	1	-0.715
40	OK	1	-0.725
41	NC	1	-0.960
42	NE	1	-1.115
43	HI	1	-1.380
44	SC	1	-1.965

California, Illinois, Kentucky, Massachusetts, New Jersey and Wyoming had missing values.

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BIOGRAPHICAL SKETCH

Gene Arlan Toy was born in Orlando, Florida. Following primary and secondary education in Orange County, he came to Gainesville and the University of Florida where he received a Bachelor of Science degree in business administration in 1968. He returned to Orlando and began teaching for the Orange County Board of Public Instruction. While teaching mathematics in the secondary schools he pursued a Master of Arts in Teaching degree at Rollins College, where he graduated in 1971. After teaching for six years he returned to the University of Florida, where he received a Master of Building Construction degree in 1975.

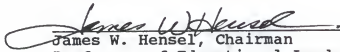
For the next five years Mr. Toy was actively involved in the construction industry. He worked in the field for three years with Frank J. Rooney, Inc., a large Florida-based general contractor. He returned to Gainesville, Florida, in 1979, to build homes.

In 1981, Mr. Toy joined the faculty in the School of Building Construction at the University of Florida. He has been teaching construction techniques, estimating, and management courses. His research work on three different State of Florida Department of Education grants resulted in

the publication of Force Account Pilot Project, Technical Publication No. 26, School of Building Construction 1983, pp. 178.; A Study of the Total Impact of the Construction Industry on Florida's Economy, Technical Publication No. 30, School of Building Construction 1984, pp. 131.; and The Impact of the Florida Construction Industry on the State Economy, Technical Publication No. 49, School of Building Construction 1987, pp. 163. He wrote "The Contractor's Role in Competitive Bid Construction" for the CEFP Journal, Council of Educational Facilities Planners, November-December 1986. Two of his articles, "Management Course Enrichment: Video, Films, Articles, Abstracts, and Computers" and "Contractor Licensing Performance" were published in 1987 and 1988 Associated Schools of Construction Proceedings, respectively. His research interests are construction economics and fire safety.

He is currently involved in the community as a member of the City of Gainesville Historic Preservation Board and chairman of the City of Gainesville Fire Safety Board of Adjustments. He is a member of the American Institute of Constructors, the National Association of Parliamentarians, Alpha Tau Omega, Phi Kappa Phi, Sigma Lambda Chi (construction honor), and Kappa Delta Pi.

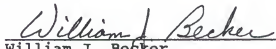
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


James W. Hensel, Chairman
Professor of Educational Leadership

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William J. Becker
Associate Professor of Agricultural
Engineering

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 1989


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